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Returns to Foreign Language Skills in a Developing Country: The Case of Turkey

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Abstract:
Foreign language skills represent a form of human capital that can be rewarded in the labor market. Drawing on data from the Adult Education Survey of 2007, this is the first study estimating returns to foreign language skills in Turkey. We contribute to the literature on the economic value of language knowledge, with a special focus on a country characterized by fast economic and social development. Although English is the most widely spoken foreign language in Turkey, we initially consider the economic value of different foreign languages among the employed males aged 25 to 65. We find positive and significant returns to proficiency in English and Russian, which increase with the level of competence. Knowledge of French and German also appears to be positively rewarded in the Turkish labor market, although their economic value seems mostly linked to an increased likelihood to hold specific occupations rather than increased earnings within occupations. Focusing on English, we also explore the heterogeneity in returns to different levels of proficiency by frequency of English use at work, birth-cohort, education, occupation and rural/urban location. The results are also robust to the endogenous specification of English language skills.
Key Words: Foreign Languages, Returns to Skills, Heterogeneity, Turkey
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1. Introduction

Foreign language skills represent a form of human capital that can be rewarded in the labor market. Several papers highlight the positive economic value of foreign language knowledge among the native populations of developed countries. Any existence of positive returns to foreign language competences is expected to be even more relevant in developing countries. Fostering widespread foreign language knowledge of the population, alongside formal schooling, might represent a stepping stone for economic development in the globalized world (Seargeant and Erling 2011). However, there are relatively few studies on this topic in the developing countries, mainly due to data limitations.

This paper investigates returns to foreign language skills in the Turkish labor market. Turkey provides an interesting case for several reasons. First, the labor market value of foreign languages in Turkey has not been previously investigated. Second, during past decades Turkey experienced impressive growth rates (albeit with intermittent crisis periods), increases in international trade and commerce, tourist arrivals, and foreign direct investments, all of which contributed to the country's rapid social and economic development. At the same time, the increasing internationalization of economic and Research and Development (R&D) activities, the growing relevance of foreign tourism, the growing exposure to international trade and globalization stimulated the demand for foreign languages (Fidrmuc and Fidrmuc 2009, Fidrmuc 2011, Hoon et al. 2011). Indeed, demand for foreign languages arises in order to better communicate and interact with foreign counterparts, producers, suppliers, consumers, customers and authorities with a view to get information on the functioning of the foreign markets and overcome the linguistic and cultural barriers. Therefore, foreign language skills of the Turkish labor force are very important for firms functioning in the international arena and, in general, for increasing the potential for further economic growth and development in the country. Fostering foreign language skills would be especially important for a mid-sized emerging economy like Turkey, contributing to improved national performance in the global knowledge economy. Rising demand for foreign languages, combined with the relatively scarce supply of competences in foreign languages among Turkish workers, generates the potential for important economic rewards for foreign language skills in this country. This paper's main aim is to analyze the existence and amount of this potential economic premium.

Additionally, this paper also provides several salient contributions through the novelty of the data, the reported evidence, and the methodology used in our empirical analysis. We draw on the Adult Education Survey (AES) data — collected by the Turkish Statistical Institute (TURKSTAT) in 2007 — that contains detailed information about knowledge and use of several foreign languages. Resultantly, we are able to present an analysis of returns to different foreign languages, without constraining the focus only to English, as previously done for other developing countries. In order to keep the empirical analysis tractable, we focus on employed males between the ages 25-65. We estimate returns to foreign language knowledge, while controlling for several human capital and labor market characteristics. With the aim of accounting for the indirect link between language and earnings through occupation, we also present estimations that control for occupation fixed-effects. Moreover, parental education is also included as an additional control, which captures the effect of unobserved factors, such as cognitive and non-cognitive skills and social networks, on earnings.

To do all this, we consider the following empirical questions. What are, on average, returns to foreign language knowledge? Are there increasing returns to different levels of skills in foreign languages? Do returns differ by the frequency of foreign language use at work? Furthermore, focusing on English, we analyze the existence of heterogeneity in returns to English skills with respect to frequency of use at work, birth-cohort, education and occupation, as well as rural/urban location. Finally, we consider several alternative econometric models that account for the endogeneity of English skills, in which we also accommodate for the interval-coding of our earnings variable and the discrete structure of English skills.

The organization of this paper is as follows. Section 2 provides background about the relevance of foreign language knowledge in Turkey. Section 3 reviews and discusses selected papers from the literature on the economic value of language skills. Section 4 describes the main characteristics of the data used. Section 5 reports the empirical results. Conclusions and policy implications appear in Section 6.

2. Background

In this section we discuss the recent developments in the Turkish economy that likely relate to increasing demand for foreign languages. These developments are related to the foreign trade policy, Turkey's foreign trade partners, the growing importance of the service sector and international tourism, as well as the increasing internationalization of economic and R&D activities, among other factors. We then highlight tendencies behind the supply of foreign language competences among the population, which, although increasing, appear insufficient to meet growing demand for foreign languages in the Turkish economy.

2.1 The Demand for Competences in Foreign Languages in Turkey

Turkey is considered as a middle-income country. It is the world's18th largest economy. The country's per-capita income, which has nearly tripled during the past decade, currently exceeds 10,000 US dollars. Since the 1990s, the Turkish economy experienced several crises. These were the adverse effects of the 1990-1991 Gulf War, the financial crisis of 1994, the combined impacts of the Russian financial crisis together with two large earthquakes in 1999, the former of which also points to the intertwined structure of the Turkish and Russian economies, and the 2001 financial crisis. The growth rate averaged 6.8% during the period 2002-2007. Finally, Turkey experienced negative effects from the 2008-2009 global crisis. Subsequently, the economy grew over 8% in 2010 and 2011 and a little more than 2% in 2012.

Several researchers such as Adak (2010), Çetinkaya and Erdoğan (2010), Kotil and Konur (2010) and Öztürk and Acaravcı (2010) suggest that the expansion of international trade appears to be one of the most important factors driving economic growth and development in Turkey over the last decade. In parallel, increasing trade openness has boosted demand for foreign language competences in the Turkish labor market, since speaking a common (foreign) language is likely to reduce transaction costs with trade partners[1]. Relevant to this increased openness, Turkey switched, at the beginning of 1980 under the guidance of IMF and the World Bank, from import substitution policies of the 1960s and the 1970s to export promotion policies, with the introduction of the structural adjustment and stabilization policies. Following this, several additional export promotion and market-based growth policies were implemented. The 1988 financial liberalization fostered both exports and imports. As a result, total trade volume, which was only 11 billion US dollars in 1980, increased to 389 billion US dollars by 2012.

Exports have increased substantially since the 1980s. Total exports were only about 3 billion US dollars in 1980 and increased to 153 billion US dollars in 2012. There was a boom in Turkish exports trade performance and competitiveness in particular after 2000 — although this slowed during the recent global crisis (Cebeci and Fernandez, 2013). In addition, Turkey became primarily an exporter of industrial products as compared to exporting mostly traditional agricultural primary products as had historically dominated. Trade openness was almost 50% in 2012 (TURKSTAT, 2013). Therefore, the country experienced an increase in trade openness as well as a significant change in the industrial composition of exports during recent decades. Furthermore, in January 1996 Turkey entered into a Customs Union with the European Union (EU), which increased competitive pressures in the domestic economy. EU countries are Turkey's main trade partners, with Germany leading amongst these. Indeed, in 2012 about 9% of Turkey's exports went to Germany. Iraq and Iran follow Germany among Turkey's export markets, each receiving about 7% of the total exports of Turkey. These in turn were followed by the UK at 5.7%, and the United Arab Emirates (UAE) and Russia each at 5.4% (TURKSTAT, 2013).

Imports also increased substantially since the 1980s. Total imports were only 8 billion US dollars in 1980 and increased to 237 billion US dollars by 2012. In 2012 Russia was

[1] Indeed, there are numerous studies and robust evidence documenting that language barriers represent an impediment to the expansion of international trade flows. Hutchinson (2005) using a gravity model shows that among non-English speaking countries there is lower trade for those whose language is more distant from English (see Isphording and Otten 2013 for more details about the use of linguistic distance measures in applied economics). Thus linguistic distance diminishes the volume of trade1. Melitz (2008) finds that direct communication in a common language is three times more effective than indirect communication in promoting trade. Ku and Zussmann 2010 and Fidrmuc and Fidrmuc (2011) estimate gravity models augmented by FLs. They suggest that significant gains can be realized by improving the linguistic skills, highlighting the role of English as lingua franca for commerce and trade.

Turkey’s leading import supplier with 11% of Turkey’s total imports. Germany followed with 9% of total imports. China was Turkey’s third largest import partner followed in turn by the U.S. and Italy each with 6%, and Iran with 5% of total imports (TURKSTAT, 2013). Also of note, 1.7% of Turkey’s total exports were to Azerbaijan, with whom Turkey shares a dialect of the Turkish language, and an additional 2.3% of Turkey’s exports are directed to the Turkic republics of former Soviet Union such as Kazakhstan, Uzbekistan, Turkmenistan and Kyrgyzstan. Anecdotal evidence suggests that for the purposes of trade and investment activities in these countries, large companies use English, mid-size companies use Russian, and small companies use local languages. There are also substantial exports to various Arabic speaking counties in the Middle East, collectively total 21% of Turkey’s exports. Anecdotal evidence indicates that trade with Arabic speaking countries is conducted in English.

Foreign Direct Investment (FDI) brings financial resources as well as technological and managerial know-how to recipient countries and thus contributes to their economic growth. In such activities, foreign language skills enable communication and interactions with foreign counterparts, authorities, or customers in order to convey information about the functioning of foreign markets and reduce linguistic and cultural barriers (Kogut and Harbir, 1988 and Benito and Gripsrud, 1992). FDI flows to Turkey were only 18 million US dollars in 1980 but increased to 12 billion US dollars in 2012. These flows had a peak of 22 billion US dollars in 2007. Turkey also has been a significant overseas investor, reaching t4 billion US dollars in 2012, an increase of 73% (UNCTAD, 2013). Moreover, after the 1988 financial liberalization, many Turkish entrepreneurs invested and established business connections in Russia, in the former Soviet Republics of Central Asia, and North Africa. Another indicator of the global reach of the Turkish economy is the percentage of the Turkish enterprises directly or indirectly under foreign control. In 2009 the foreign control rate was 15.4%, up from 14.1% in 2008. Germany leads with a 17.1% share of foreign controlled production, while the USA follows closely with a 14.9% share of foreign controlled production.

In parallel, foreign language skills are also strongly connected with R&D activities both in business and in the academic world, as suggested by Fidrmuc (2011). Command of foreign languages enables R&D personnel in the business sector and in academia to follow new scientific and technological developments, and to interact with international researchers and institutions. Improving competences in foreign languages would thus increase the country's research potential, leading to more innovation and other productive investments that may promote economic growth in both the short-run (Segerstrom, 2000) and the long-run (Howitt, 1999). However, Turkey's R&D expenditures and R&D personnel are low compared to their OECD peers (Özçelik and Taymaz, 2008). The share of R&D expenditure in 2009 Gross Domestic Product (GDP) was only 0.85% in Turkey, compared to 2.9% in Germany (EUROSTAT, 2012). The number of R&D personnel (per million people) was only 680 researchers in Turkey in 2007, compared to 3,521 R&D employees in Germany (World Bank, 2011). According to the Ninth Development Plan (SPO, 2006), Turkey plans to increase its R&D expenditures and personnel. Moreover, it has been argued that Turkey has not be able to attract foreign R&D investments in several key sectors. For that reason, several policies have been implemented both at the national and local levels, with the aim of increasing the country's attractiveness for foreign investors (Karabag et al. 2011). Overall, these changes are increasing the need for foreign language skills in future years, since R&D personnel will have to be proficient to perform scientific and innovative activities, as well as to attract more international R&D investments, which in turn will enhance economic growth.

Moreover, during recent decades a rapid structural transformation took place in the Turkish labor market, with declining agricultural employment and a relative increase of service sector employment, including tourism[2]. In the earlier periods, about half of total employment was in agriculture while currently, although agriculture is still important, half of the total employed population now works in the services sector. Since the early 1980s, the growth of tourism, in particular, has been substantial. Existing evidence suggests a positive contribution of tourism to GDP growth in Turkey (see Gunduz and Hatemi 2005

[2] Regarding this point, Leslie et al. (2001) highlight the importance of the foreign language skills for the development of the tourism sector which contributes to both the employment and the GDP of the country, and Tucci and Wagner (2004) show the importance of FL skills in the services sector.

and Arslanturk et al 2011 among others). Foreign arrivals, only about 10 million in 2000, reached approximately 32 million by 2012—a more than 200 percent increase within 12 years. In 2012 the most foreign tourists to Turkey arrived from Germany (16% of total foreign arrivals), followed by Russia at 11%, the UK at 8%, Bulgaria at 5%, and the Netherlands and Iran each at 4% ― see TURKSTAT (2013). Interestingly, during the first six months of 2013 tourist arrivals from Russia exceeded those from Germany.

Taken together, recent high growth rates, increasing trade openness and economic internationalization, the phenomenal growth of the tourism sector and other changes in the structure of the Turkish labor market, and the on-going intensification of R&D activity in the Turkish economy represent the main factors contributing to increased demand for foreign language skills in the country. Moreover, the 1999 announcement of candidacy of Turkey for full membership in the European Union (EU) and the accession negotiations to the EU since October 2005 have also increased the demand for foreign language skills. This is particularly true in the case of English, because of its role as the international *lingua franca* for commerce and trade (Ku and Zussmann 2010, Fidrmuc 2011). Still, we also expect a growing importance of competences in German, Russian, and — to a lesser extent —French.

2.2 The Supply of Skills in Foreign Languages among the Turkish Labor Force

The corollary of this demand for foreign language competences is the supply of foreign language skills in the Turkish labor market[3]. In Turkey, competences in foreign languages are mainly acquired at either schools or private language centers[4], the latter of which are

[3] The mother tongue of the most people in Turkey is Turkish, which is not an Indo-European language but belongs to the Altay-Uralic language family. Turkish is the only official language. However, there are many other native languages spoken in Turkey. Most notable among these are Kurdish and Arabic. Yağmur (2001) gives the distribution of 40 different, other native languages and their estimated number of speakers in Turkey. According to the most recent Turkish Demographic Health Survey (TDHS 2008), Turkish is the mother tongue of about 82 percent of the ever married women and their partners in a nationally representative sample. Kurdish is the mother tongue of the 15 percent in the same sample, while Arabic is the mother tongue of the 2.2 percent. Further, of those whose mother tongue is Kurdish, 86 percent of women and 98 percent of men also speak Turkish. Of those whose mother tongue is Arabic, 91 percent of women and 99 percent of men also speak Turkish.

[4] Foreign language knowledge in Turkey may also be related to migration background. For example, there have been several important waves of migration of ethnic Turks (i.e. individuals with direct or indirect Turkish origins) from Bulgaria to Turkey who would know Bulgarian as well as Russian. Moreover, more recently many Turkish immigrants (first and second generations) residing in Germany returned Turkey (Aydın, 2012), and they would have some proficiency

common across the country. During the 2010-2011 academic year, 34,905 individuals, about half of which were women, completed a course in a foreign language at a private language center. 92% of students studied English and 5% percent studied German. The remaining 3% completed courses in Arabic, French, Italian, Japanese, Spanish and Russian (TURKSTAT, 2012).

Foreign language instruction in the Turkish education system has changed significantly over time. French was the common foreign language studied in schools before the 1950s. However, English has replaced French during recent decades, and is now the most widely studied foreign language at schools in Turkey. Until the 1997 educational reform[5], foreign language instruction in public schools started at the sixth grade and continued throughout high school, with courses running three hours per week. Moreover, the so-called 'Anatolian' high schools, which are highly-selective public high schools, offer more intensive English instruction. A few of these high schools also provide intensive training in either French or German. There are also private schools at all education levels in Turkey, where the language of all instruction is a foreign language, usually English.

Finally, Arabic is taught in religious vocation high schools. Before the Educational Reform of 1997, Arabic instruction started at the sixth grade but since then starts in ninth grade at these schools. There are also Anatolian religious vocation high schools where both Arabic and English are taught intensively. At the university level, an increasing number of public universities have adopted English as medium of instruction, either only for some degrees or for the whole university. Turkish medium-of-instruction universities have elective foreign language courses, predominantly English, and there is an increasing tendency to offer at least some degrees taught entirely in English. Finally, English is usually the main language of instruction at most private universities.

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in German. The number of German and Turkish people migrating from Germany to Turkey added up to 39.6 thousand people at the peak of the global crisis in 2009 and was 32.8 thousand people in 2012 (Federal Statistical Office of Germany, 2013).

[5] In general, the Turkish Education System experienced an increase in the emphasis given to teaching of foreign languages since after the educational reform of 1997. Moreover, the 1997 reform also extended compulsory schooling from five to eight years, covering also middle school (while before 1997 only five years of primary schooling were compulsory). However, here we refer to the pre-1997 period, since our data do not cover individuals who were affected by the 1997 reform of the Turkish education system. In any case, it seems also worth mentioning that another change occurred in 2012, which established twelve years of compulsory education and a further increase of foreign language instruction at schools which is being implemented gradually.

The Turkish government has also tried to foster competences in foreign languages among public sector workers. Since the early 1990s, civil servants receive salary premiums depending on their proficiency levels in various foreign languages. A voluntary examination is administered annually to those civil servants who would like to participate. This must be re-taken every five years to maintain qualification for the salary premium, the amount of which depends on the attained proficiency level.

In spite of such efforts to increase competences in foreign languages, and other labor market skills more generally, Turkey is characterized by a significant English language deficiency, as pointed out by Koru & Akesson (2011). This comes as OECD (2012) and Tansel (2012) emphasize the need to increase the English proficiency of the Turkish labor force in order to improve employability and labor mobility in today's globalized setting. However, according to Education First (2011 and 2012) the English Proficiency Index (EPI) of Turkey was 37.66 in 2011 and 51.19 in 2012. Accordingly, in 2011 Turkey was characterized as a "very low proficiency" country, ranking second from the bottom among the 33 countries examined. Similarly, in 2012 Turkey placed 32nd from the bottom among 54 countries, and was listed as a "low proficiency" country. A similar picture is provided by data from the special 2006 Eurobarometer Survey about languages in Europe[6] (see European Union 2006). Those data indicate that Turkey has the highest percentage of population declaring an inability to have a conversation in a language different from the mother tongue among EU 25 countries and four candidate countries (67%, compared to the EU 25 average of 44%). Thus, the presence of growing demand for foreign languages, together with the relatively scarce, albeit growing, supply of foreign language competences among Turkish workers, generates the potential for important economic rewards to foreign language skills in the country. Quantifying this economic return and finding out the foreign languages that matter most in the labor market are the main aims of this paper.

[6] Turkey as candidate country participated in the 2006 edition of the Eurobarometer; however, she did not participate in the subsequent edition of the same survey in 2012.

3. The Economic Return to Language Skills: Selected Literature

The relevance of language competences as an economic asset has gained substantial importance in the literature during the last decades. Indeed, language proficiency is generally considered as another form of human capital since, in the same fashion as formal schooling, it is a costly asset that is embodied in the individual and is likely to be productive in the labor market (see Chiswick and Miller, 1995, 2007 and Chiswick 2008 for a general overview). Most of the literature concerns immigrants, because competences in a host country's language are fundamental for their economic and social integration. However, the same framework can be applied for explaining the positive labor market value of skills in both local and foreign languages among the native population. There are several explanations for the positive relationship between language proficiency and earnings. First, language might directly affect productivity, because fluency in the language employed in the workplace enhances efficiency in communication among coworkers, managers, buyers and sellers, etc. Second, language itself represents a mechanism for achieving more prestigious occupations that are also likely to be better remunerated (see Chiswick and Miller 2009, Quella and Rendon 2012), and workers obtain a premium if their language skills match linguistic requirements in the workplace (see Chiswick and Miller 2010, 2013, where in the second paper the authors consider the same issue from the perspective of overeducation framework). This means that a substantial part of the positive relationship between language competences and earnings is indirect, operating through the occupational channel[7].

Third, language competences might be remunerated also when not directly used/relevant in the workplace, since this asset represents a positive signal for other cognitive skills from the employer's perspective. Indeed, there is substantial evidence in the literature on the improved cognitive skills of those individuals who are bilingual or who have studied a foreign language. Cooper (1987) and Olsen and Brown (1992) find higher college entrance examination scores among students who have studied a foreign language

[7] Indeed, the results presented by Aldashev et al. (2009) suggest that the positive effect of language proficiency among immigrants in Germany is completely driven by occupational selection, given that is disappears once the endogenous selection into economic sector and occupation is controlled for.

in high school in the U.S. According to Bialystok (1999) and Adesope et al. (2010) who extensively investigated bilingualism, the bilingual individuals have a generalized cognitive advantage over monolinguals in the so called executive functions involving mental flexibility, inhibitory control, attention control, and task switching as well as creativity, flexibility, and originality in problem solving (Leikin, 2012). Thus, in this context, language competences could increase earnings directly by raising an individual's productivity. They could also increase earnings indirectly, favoring the access to better remunerated occupations in which language is important, or by signaling to an employer regarding the quality of education, ability and cognitive skills, and potential productivity.

The importance of knowing the language of the host country for the immigrants has been extensively studied in the context of many countries. Such studies include, among others, Chiswick and Miller (1995) in Australia, Dustmann (1994), Dustmann and van Soest (2001 and 2002) in Germany, Berman, Lang and Siniver (2003) and Lang and Siniver (2009) in Israel, Leslie and Lindley (2001), Shields and Price (2002) and Dustmann and Fabbri (2003) in the UK, and Bleakley and Chin (2004) in the U.S. It is well established in this literature that immigrants with destination country language skills obtain a positive (overall) earnings premium. Moreover, it seems that the importance of language proficiency among immigrants goes beyond the labor market, because it also improves social integration and assimilation in the host country, as recently shown by Bleakley and Chin (2010).

There is also a second parallel strand of research that focuses on the case of non-immigrants in multilingual labor markets. Shapiro and Stelcner (1997) and Albouy (2008) consider the case of Canada, where the latter study finds earnings premium to French skills among Anglophones in Quebec. Several other developed countries characterized by multilingual realities have also been investigated (see Klein, 2003 for Luxemburg, Henley & Jones, 2005 for Wales, Grin and Sfreddo, 1998 and Cattaneo and Winkelman, 2005 for Switzerland, Rendon, 2007, Di Paolo, 2011 and Di Paolo and Raymond 2012 for Catalonia —Spain) and the results obtained are usually consistent with the hypothesis that local language skills are remunerated in the labor market.

Moreover, a growing number of papers consider the return to foreign language skills among the native population. The relationship between foreign language knowledge and labor market outcomes in developed countries has been considered in the work by Saiz and Zoido (2005), who studied the return to foreign languages using a sample of US college graduates. Willams (2011) reports significant earnings premiums for English usage at work in twelve European countries, as well as for the use of other languages, especially French and German, in some cases. Ginsburgh and Prieto-Rodriguez (2011), who also focused on several European countries, confirmed the existence of a substantial return to English proficiency. Also Lang and Siniver (2009), who analyzed the case of English in Israel (as well as Hebrew among immigrants from Russia) shows that this language knowledge is significantly remunerated in the Israeli labor market for both immigrants and natives, although the return to English skills appears heterogeneous for different groups of workers.

The economic return to English proficiency has also been analyzed in some developing countries, such as Latvia and Estonia, where Toomet (2011) found that skills in local languages are not remunerated in these countries while English proficiency produces a significant earnings premium. Levinsohn (2007) and Casale and Posel (2011) reported high returns to English competences in South Africa and Azam et al. (2013) also obtained substantial earning return to skills in English in India, especially among male workers. From this evidence, English skills definitely appear to be a valuable asset in developing countries. Our study resembles to the last group concerned with developing countries, since we investigate the return to foreign language skills in Turkey. However, it should be noticed that in both South Africa and India English is the former colonial language[8] and currently one of the official languages, whereas this is not the case in Turkey, Latvia or Estonia. Indeed, in these countries English is a non-native and non-official language. In this sense our study is close to the paper by Toomet (2011), except that he considers the case of

[8] Angrist and Lavy (1997) estimate the return to proficiency in French in Morocco, which is also the colonial language and was used as language of instruction until 1983 (and was replaced by Arabic since then). They also found that the return to education were substantially lower for those who were schooled in Arabic (relative to those who received instruction in French), mostly because of reduced French skills. A similar case has been considered by Angrist et al (2008), who studied the effect of the change of the instruction language in Porto Rico — which switched from English to Spanish in 1949. They found no effect of this language-of-instruction reform on English skills among the affected population.

Russian minority in Latvia and Estonia, whereas we consider the total native population of Turkey. In addition, unlike the previous studies concerned with developing economies, we first consider the return to several foreign languages spoken in Turkey (in a similar fashion than in Willams, 2011) and then we analyze more deeply the English language skills, given that it represents the more common foreign language in Turkey as well as in many other non-English speaking countries.

In parallel to the empirical evidence, the theory behind foreign language acquisition has been developed in a game theoretic framework, starting with the pioneer work by Selten and Pool (1991), which highlights the importance of benefits and costs of foreign language acquisition. The subsequent papers by Church and King (1993), Ginsburgh et al. (2007) and Gabszewicz et al. (2011a, 2011b) point out the relevance of network externalities in foreign language acquisition, suggesting that the incentives to learn a given non-native language would be higher the greater the size of the community that speak the language (relative to the population that speaks the individual's native language). If translated to the labor market perspective, this theoretical prediction suggests that the benefits from learning a foreign language should increase with the "labor market relevance" of that language.

4. Data and Descriptive Statistics

The empirical analysis is based on nationally-representative Turkish data from the Adult Education Survey (AES). The AES was carried out in 2007 in all European Union member states, EFTA, and candidate countries, including Turkey, with the aim of obtaining information about adult education activities and lifelong learning. This survey is especially appealing for our purposes, since it contains detailed information about foreign language knowledge, skills and use, together with socio-demographic characteristics and labor market characteristics. The overall sample includes 39,478 individuals aged 18 and over. Our main goal consists of analyzing the relationship between foreign language knowledge and labor market earnings. We restrict the sample to males aged 25-65 who were regularly employed at the time of the survey[9]. We excluded part-time workers, because they might have a different attachment to the labor market. There are very few immigrant males in the sample (less than 2%), and are also dropped from our selected sample. After deleting the observations with missing information about earnings or other relevant variables, we ended up with a final sample of 9,194 male workers.

The AES survey contains several questions about foreign language (FL henceforth) knowledge. Individuals are asked about their knowledge of up to 7 FLs. In the case of having some knowledge of at least one FL, individuals report detailed information about the two FLs they know best. Specifically, the questionnaire asks about the level of skills of the two best known FLs, the way in which they learnt that languages, as well as their frequency of use at work and for leisure. Table 1 shows the basic descriptive statistics about the knowledge of FLs in our selected sample.

[TABLE 1 AROUND HERE]

Roughly 67% of the individuals in the sample do not speak any FLs — highlighting again the relatively scarce endowment of FL competences in Turkey[10]. Of the one in three individuals able to speak at least one FL, most only speak just one. FL knowledge is more common among the younger cohort, those with greater educational attainment, and among white collar workers, especially if otherwise high-skilled. Knowing at least one FL is also more common in urban areas than in rural areas[11].

Table 2 reports the specific languages spoken among those who declare some knowledge of FLs. It appears that English is the most widely known FL, with almost 80%

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[9] Females are excluded from the analysis in order to avoid problems of endogenous selection into labor market participation and employment. We consider individuals aged between 25 and 65 because regular schooling is usually completed before 25 years of age and can therefore be taken as exogenous, which helps to limit the potential endogeneity of schooling in the earning regressions. Selection into employment among males could also be an issue. For this reason, we controlled for endogenous selection into employment among males and the results are virtually unchanged (full results are available upon request). Therefore, we decided to focus on employed males, implying that we aim at providing evidences that are consistent for the selected sample.

[10] Indeed, raw data from AES suggest that Turkey is the country with the highest percentage of individuals who declare no knowledge of any FL (75.5% in the whole sample), compared to the Europe-27 average of 37.5%. The numbers from Turkey are relatively similar only to those from Hungary (74.8%) and Romania (69.6%). More details can be consulted here: http://epp.eurostat.ec.europa.eu/portal/page/portal/education/data/database. Notice that this evidence is consistent with the results obtained in the Eurobarometer Survey of 2006, albeit slightly worse (probably because the AES data discussed above refer to individuals aged 25-65).

[11] Locations with population over 20,000 are defined as urban and the locations with population 20,000 or less are defined as rural areas.

of those who possess some knowledge of FLs declaring that English is one of the languages they know — at least to some extent. This evidence reflects the preeminence of English as *Lingua Franca* during recent decades. German represents the second most frequent language known by 12%, and considerably less common than English. The number of German speakers in Turkey reflects Germany's position both as an important trade partner for Turkey, with the largest share of Turkey' exports as noted above, and also as a traditional destination country for Turkish immigrants. Arabic is the third most frequent language (9.5%), which is taught as subject in religious vocation high schools and might be common among the indigenous population in the south-southeast of the country as well as to people with some migration experience in MENA countries (which were alternative migration destinations during the '80s), followed by French (7.3%), which was widely taught as part of the oldest generation's schooling. Less common are Russian (2.6%) and Bulgarian (0.4%) both of which are not taught in the school system. However, these two languages are likely to be commonly known by ethnic Turks who migrated from Bulgaria, as well as returning Turkish workers from the migration wave towards Russia and Central Asia that occurred in since the 1990s (Tansel and Yaşar, 2010).

[TABLE 2 AROUND HERE]

Crossing this information with birth-cohort reveals that English is relatively more common within the younger cohort, as is Russian, while the knowledge of German, Arabic and French is somewhat higher among older populations. Disentangling the frequency of FL knowledge by education suggests that, on the one hand, English is mostly learnt through the schooling process for younger cohorts while French was more commonly learnt at school among older cohorts. On the other hand, Russian, German, and especially Arabic are significantly more common among the less educated. In particular, almost 50 percent of Arabic speakers sampled have 5 or fewer years of schooling. Especially those who know German among the less educated may be return migrants from Germany, but, unfortunately, we do not have information about previous migration experiences. The most noticeable evidence obtained from separating the sample by occupation is that, as expected, English is more frequently known among white collar workers, while blue collar workers who declare to know FLs are relatively more likely to know Arabic. Finally, the incidence of Arabic knowledge and — to a lesser extent — of German knowledge appear to be relatively higher in rural areas. In the case of German, this evidence might be reflecting previous (direct or indirect) migration background from Germany. Regarding Arabic, its incidence among low educated individuals residing in rural areas might mirror ethnic identities with Arabic roots[12].

In Table 3 we focus more deeply on the FL individuals know better. Foremost, it emerges that English represents the primary FL for about three-fourths of FL speakers, followed by German (8.4%), Arabic (6.9%) and French (5.2%). Additional evidence can be obtained by considering the information about the way in which people learnt the best FL they know (not shown here). Remarkably, although most of the people declare they acquired English skills at school (79% among those who affirm English to be the best FL they know), learning this language in a private course (10%) as well as by self-learning (8%) are relatively common options. On the contrary, 94% of French speakers learnt this language at school. The evidence about German, Russian and Bulgarian are consistent with the migration/ethnic background hypothesis, since the share of individuals who declare to have learnt these language abroad is significantly higher than for other languages. Moreover, among Bulgarian speakers, the schooling mechanism it's also common, since they might be Ethnic Turks who received some schooling in Bulgaria and then return to Turkey. Finally, albeit 29% of those that consider Arabic as the best FL they know learnt Arabic at (religious vocation) school, 45% of individuals declare they acquired the language within the family (which is in line with the idea of ethnic origins of Arabic roots).

We can also go into more detail about the quality level of FL skills[13]. Among those who declare English to be their first FL, 55% report having a basic level, about 32% have regular skills and only 13% are fully proficient in English with advanced skills. The

[12] Unfortunately, discern this point is not possible since the Turkish questionnaire of the AES survey does not include specific questions about mother tongue (which are indeed included for other countries). Therefore, the information about Arabic knowledge should be taken with caution, since its distinction with ethnic background is somewhat subtle.

[13] Notice that the AES questionnaire contemplate four different self-reported levels of command of foreign languages, namely 1 "I can understand and speak a few words and sentences", 2 "I can understand and use the most general daily expressions", 3 "in the instances where the language is used in a clear fashion, I can understand the essence and express the experiences and events in a printed text" and 4 "I can understand and use the language in a flexible (fluent) manner in various subjects involving a series of difficult texts. I am almost completely competent in this language". Given the low number of cases for levels 3 and 4 we decided to group these two FL command levels into one. Therefore, in the empirical analysis we will use 3 separate levels of skills: 1) basic skills (corresponding the original level 1 in the survey), 2) regular skills (corresponding to level 2) and advanced skills (corresponding to either level 3 or 4 in the AES questionnaire).

distribution of German skills follows a similar pattern, whereas French skills are mostly concentrated into the basic level and those who claim Arabic to be their first FL are relatively more likely to have an advanced level of command of that language[14].

[TABLE 3 AROUND HERE]

Finally, raw earning differentials by general FL knowledge are reported in Table 4. The AES survey includes net monthly earnings from the main job (in Turkish liras), which are reported in five distinct intervals. Tabulating interval-coded monthly earnings shows that the incidence of top-coded earnings is significantly higher among those who speak at least one FL, while the frequency of low-earnings is also lower among this sub-group of workers in our sample. This means that, to some extent, knowing a FL is generally associated with higher earnings. Similar evidence can be obtained computing average monthly earnings[15], which are markedly higher among FL speakers. However, not all FLs are associated with higher earnings, as shown in the rest of the columns in Table 4.

[TABLE 4 AROUND HERE]

Indeed, the knowledge of German, English, Russian, or French is clearly associated with higher earnings—i.e. higher relative frequency in higher earnings categories and lower frequency in lower earnings categories, as well as higher average earnings. However, this is clearly not the case for Arabic and Bulgarian, which instead seem associated with lower earnings. Nevertheless, the relationship between FL knowledge and earnings that we observe in the raw data might be confounded by other individual and labor market characteristics that are likely to co-vary with both FL knowledge and earnings. Therefore, in the next section we analyze the return to FL knowledge in a regression framework, which would provide the *ceteris paribus* or conditional association between FL knowledge and skills and labor market earnings. The complete list of explanatory variables used in the empirical analysis is provided in Table 1A in the Appendix (the content of each variable is self-explanatory), together with some descriptive statistics for different sub-samples of workers.

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[14] The distribution of skills in Russian indicates that the majority of those who declare this language to be the first FL they know report regular skills, while Bulgarian skills are uniformly distributed across the three categories. However, these numbers should be read with caution because of the reduced number of cases in the selected sample.

[15] Average monthly earnings are obtained regressing interval-coded earnings on a constant, using the "Interval Regression" method ("intreg" command in STATA) developed by Stewart (1983).

5. Empirical Results

5.1 Foreign Language Knowledge and Earnings

In this section we study the conditional relationship between FL knowledge and labor market earnings. Table 5 contains the results from several regressions of (logged) interval-coded earnings[16] on typical human capital and labor market variables, plus different indicators of FL knowledge. First, we include dummies for the number of FLs that are known by each individual in the sample. Second, we estimate several separate equations containing a dummy for each specific FL, considering English, French, German, Arabic, Bulgarian, and Russian respectively. Third, the set of indicators for general knowledge of each of these six different FLs is jointly included in the earnings regression. Finally, using this more complete specification, we add in two subsequent steps: occupation fixed-effects and dummies for parental education. The inclusion of occupation fixed-effects (two-digit ISCO88 classification) informs us about the extent to which the relationship between FL knowledge and earnings is indirect, working through the occupational channel — i.e. individuals who know FLs earn more because they are attracted into better paid occupations. Furthermore, controlling for the highest parental education among the two parents should limit the potential bias provoked by the omission of relevant unobservable characteristics, such as cognitive-and non-cognitive ability and social networks.

[TABLE 5 AROUND HERE]

The estimates of the control variables are quite standard and are just briefly discussed in what follows. The earning return to one additional year of schooling ranges between 7.4% and 8.1% when occupation is not included in the model. The noticeable evidence is that the return to schooling in specifications that contain single dummies for FL knowledge is roughly the same when no language control is included (i.e. 8.1%). However, it falls to 7.4% with the inclusion of the English dummy, suggesting that schooling, especially for younger cohorts of workers, represents an important mechanism to foster English knowledge. As expected, the return to schooling decreases after controlling for occupation

[16] As briefly commented above, net monthly earnings are reported in intervals. Therefore, regression analysis is based on the Interval Regression model (Stewart, 1983), estimated by Maximum Likelihood (“intreg” command in STATA). Similar results are obtained employing the typical mid-point approximation (available upon request).

fixed effects, indicating that occupation mediates the conditional association between schooling and earnings. Potential experience presents the typical inverted U-shaped pattern, which is quite stable across specifications. We also include dummies for the type of employment[17]. Compared to employees with a permanent contract, salaried workers with a fixed-term contract earn about 24-25% less. Also self-employed workers obtain slightly lower earnings, albeit this differential disappears once controlling for occupation. On the other hand, employers receive on average 41% higher earnings than the reference group; this positive earning differential decreases to 36% when estimated within the same occupation. We also control for urban location, in order to account for the uneven structure of the labor market across the Turkish territory. This dummy shows that workers in urban areas earn 25% more on average than those in rural areas. Moreover, accounting for urban/rural residential location, slightly reduces the return to English and Russian knowledge and — even more significantly — to Arabic knowledge, capturing some part of local labor market heterogeneity.

The first column of Table 5 shows that having some knowledge of one FL is associated, on average, with 9% higher earnings. This positive return increases to 14% in the case of knowing two FLs and up to 32% in the infrequent case of having some level of command of three or more FLs. However, unpacking the return to each distinct FL confirms that not all languages are equally rewarded in the labor market. In fact, while English has a clearly significant earnings return—around 11%, the estimate for French is positive but statistically insignificant. Having some knowledge of German is positively rewarded with estimated return of about 6.4%, but knowing either Arabic or Bulgarian seems to be conditionally unrelated to labor market earnings. Finally, we obtain a noticeably high and significant return to Russian knowledge, which is associated with 19% higher monthly earnings. When we simultaneously include all the dummies for FLs knowledge, the point estimates of English and German knowledge remain virtually unchanged. We observe that the return to French knowledge becomes significant and slightly higher when all the languages are taken into account. This means that, conditional on the general command of other FLs (mainly

[17] The point estimates of our coefficients of interest (i.e. those associated with FL knowledge indicators) are invariant to the inclusion of dummies for the type of employment. After testing different alternative specification, the Bayesian Information Criterion indicates that the model performs better when type of employment dummies are included.

English), mastering French could also represent a labor market asset. However, the return to Russian knowledge is somewhat reduced in this full specification, indicating that at least some part of the estimated return to Russian knowledge might be driven by other "language-related" unobservable characteristics.

After controlling for occupation fixed effects[18], we obtain a lower return to English knowledge. It appears that occupation itself accounts for about 20% of the return to English knowledge. However, even among workers within the same occupation, the earnings return to general English knowledge is substantial and strongly significant. A similar pattern is observed for the case of French and German knowledge. Notice that, for the latter language, the estimated return is no longer significant when estimated within occupations, suggesting that the economic value of German knowledge in Turkey is mostly produced through the occupational channel. No significant changes are observed for Russian and Bulgarian knowledge, whilst controlling for occupation yields a slightly significant negative coefficient for Arabic[19].

In the final step, we also include dummies for parental education, which might capture some effect of potentially relevant unobservables (correlated with parental education), such as cognitive-and-non-cognitive ability and social networks. Notably, parental education is a significant predictor of monthly earnings, pointing to a certain degree of social segmentation in the Turkish labor market. Moreover, we observe a very modest reduction in the point estimates of the English knowledge and imperceptible changes in the other language coefficients after including parental education.

[18] We also tried to include dummies for economic sector. However, once controlling for occupation, the inclusion of sector fixed effects barely affected the return to FL knowledge (in a similar fashion as in Azam et al., 2013). Therefore, sector dummies have been suppressed in order to simplify the presentation (the full results are available upon request). It might be argued that the inclusion of occupation fixed effects represents "bad controls" (Angrist and Pischke, 2009), in the sense that the estimation of the treatment effect's parameter (i.e. FL return) is confounded by the inclusion of controls that depend on the treatment itself (i.e. occupation). Therefore, under positive occupational sorting, the mediating impact of occupation in the language-earning relationship is likely to represent a lower bound of the whole relevance of occupation.

[19] This result, together with the evidence that knowledge of Arabic is more common among older and less educated workers located mostly in rural areas, point out that the negative relationship between Arabic language knowledge and earnings is probably due to the fact that Arabic knowledge does not always represent an "investment" in a FL and thus this negative return should be taken with caution. We believe that disposing of information about the region of residence would help in disentangling this evidence since we expect that this negative differential is driven by residents in the southeastern part of the country. However, the regional identifiers of the Turkish AES 2007 data are not released due to data protection legislation.

This last evidence points out the robustness of our results in the light of potential omitted variables bias. Indeed, it might be argued that the positive relationship between FL knowledge and earnings is mostly driven by unobserved individual heterogeneity. However, we argue that this is unlikely to be the case. Following Lang and Siniver (2009), obtaining similar estimates when all the possible FLs are simultaneously included in the earnings equation can be taken as indicative of a barely relevant impact of unobserved ability in biasing our estimated coefficients. The idea is that the ability to learn two or more different FLs should be similarly correlated with general unobservable skills. Indeed, if knowing different languages mainly depends on unobserved ability, we should observe significant changes in the estimated coefficients when all FL dummies are simultaneously included. The opposite evidence can be taken as suggestive of a relatively limited bias due to unobserved ability. In our case, the coefficients associated to English and German knowledge are virtually unaffected by the inclusion of other FL indicators in the regression and no statistically significant differences are observed for other languages. This again supports the fact that our results are not just reflecting unobserved individual heterogeneity. A more convincing argument has been proposed by Saiz and Zoido (2005), who estimate the return to FLs among US college graduates using two-period panel data, exploiting past information about FL knowledge. They argue that if unobserved ability is the main driver of the return to language skills, one should observe similar earnings returns for those who currently speak a FL and those who were able to do it only in the past but not in the current period[20].

Unfortunately, in our cross-section data we only have information about current language knowledge. However, we argue that if the positive association between FL knowledge and earnings is just due to the fact that more able individuals are more likely to know at least one FL and also to earn more, we should not find any significant return to the

[20] Indeed, Saiz and Zoido (2005) obtain a statistically insignificant coefficient for the indicator capturing those who were able to speak a FL in the initial observation but not in the current period, suggesting that the impact of omitted ability should be rather limited. Their results using panel data and propensity score matching support this hypothesis. Also the panel data estimates for the return to English proficiency reported in Lang and Siniver (2009) are virtually identical to those obtained by OLS (albeit the return to Hebrew proficiency appear to be lower in their longitudinal estimates), which means that FL knowledge should, at least in part, represent an investment in human capital that is remunerated in the labor market rather than just reflecting unobserved ability.

knowledge of an additional language among the subsample of speakers of a (common) FL. This intuition derives from the fact that this subsample should be more homogeneous in terms of unobserved attributes that facilitate FL knowledge and probably affect earnings potential. Therefore, we perform additional language-augmented regressions using the subsample of workers that declare English to be the best FL language they know, as English is the most common FL in the sample. Selected results are shown in Table 2A in the Appendix and, with the exception of Arabic, display a positive return to the additional investment in human capital enclosed in the knowledge of other languages especially French and Russian among English speakers. In any case, the evidence suggests that the return to FL knowledge is not just a mirror of ability bias. In what follows we analyze in more detail the economic value of different levels of skills in FLs and its heterogeneity for different subgroups of workers. After that, we check for the robustness of our results with respect to the potential endogeneity of English competences in a more compelling way (see section 5.4).

5.2 Earnings Return to Different Skill Levels in FLs

The results in the previous section point out that having some knowledge of languages other than the mother-tongue generally has a market value in Turkey. However, if the labor market pays a different price for different levels of command of a language, general levels of FL knowledge might be just a partial picture of the earnings return to this human capital asset. Hence, we exploit the available information about different skill levels in the best FL an individual knows[21]. Table 6 reports the results of several earning regressions with dummies for different level of competences in each FL (columns 1-4). Finally, dummies for skills in all the relevant languages are jointly included into one single equation (column 5),

[21] Albeit we also dispose of information about skills in the second FL, we just focus on the first FL because of the reduced number of individuals who know more than one FL. Indeed, the returns to skills in second FLs are mostly insignificant and the estimates for skills in the first FL are robust to the inclusion of second foreign language's skills. Moreover, we consider a more parsimonious specification that incorporates only skills in languages that have a positive return in this step of our analysis (i.e. we do not include skills in either Arabic or Bulgarian, given that these languages appear not to be rewarded in the labor market). Notice also that the estimated models contain the same set of controls reported in Table 5, whose estimates are roughly the same and are neither reported nor discussed here for brevity reasons. Further, we also tried to control for the way in which people learnt the best FL they know and the results were virtually the same.

which is successively augmented by occupation fixed effects and parental education as additional controls (columns 6-7).

[TABLE 6 AROUND HERE]

The results concerning English skills reveal that there is a positive and increasing earnings return to different levels of proficiency in English—an up to 45% increase in earnings for advanced skills. It seems worth highlighting that our estimates of the returns to different skill levels in English are very close to those reported by Azam et al. (2013) in India, who found that for men in India return to speaking fluent English is 35% and for speaking little English is 13% relative to men who speak no English[22]. Regarding Russian skills, the results from our estimation reveal that only very proficient individuals are able to obtain a significant remuneration for their competences in Russian of about 37%, although returns to lower skill levels are imprecisely estimated. In contrast, when dummies for French and German skills are individually included in the earnings regression, we do not find any significant return to skills in these two languages.

More compelling evidence can be obtained by including all the dummies for the skill levels in each of the four relevant FLs in the earning equation. Indeed, the return to English skills is almost unaffected by this exercise, except that basic English skills now receive a slightly higher remuneration of 4.1%. Further, there is a slightly significant return to regular French skills and to basic or advanced skills in German. Moreover, the market price of advanced Russian skills is still positive, significant and slightly higher, while that of the regular Russian skills becomes now marginally statistically significant and somewhat higher. Adding occupation fixed effects to this model produces a modest reduction in the estimated return to FL skills, indicating again that FL knowledge also affects earnings indirectly — via occupational attainments. Specifically, returns to regular French skills lose statistical significance and returns to regular Russian skills become marginally higher and more significant when estimated within the same occupation. Finally, when parental

[22] Our results regarding the return to English skills are also in line to what reported elsewhere in the literature, for developed (Lang and Siniver, 2009, Willams, 2011 and Ginsburgh and Prieto-Rodríguez, 2011) and developing countries (Levinsohn, 2007 and Casale and Posel, 2011 Toomet, 2011), albeit that the indicators for English proficiency are not always directly comparable. The main exception are the results obtained by Saiz and Zoido (2005), who find 2-3% return to speaking a second language for college graduates in the US. This relatively low return is in all likelihood due to the fact that English represents a *lingua franca* for international trade, although it might be also a consequence of the peculiarity of the sample used. This is also consistent with the evidence reported by Willams (2011) for UK and Ireland, where no significant returns are obtained for the use of FLs (other than English) at work.

education is included as further control, we observe an additional reduction in the estimated return to FL skills, which is completely imperceptible from a statistical point of view.

Our analysis reveals that competences in FLs are positively rewarded in the Turkish labor market, although not all the languages have the same return in terms of earnings. In fact, there is no earning premium for knowing Bulgarian or Arabic. There is some evidence of positive return to French and German knowledge, although the economic value of competences in these two languages appears to be conditional on specific occupational attainments and on the knowledge of other FLs (i.e. English). Competences in Russian are more clearly associated with higher earnings, especially in the case of having advanced skills. Last but not least, returns to English knowledge are clearly positive and statistically robust in several specifications (i.e. controlling for other languages, occupation and parental education). Moreover, the earnings premium of English knowledge increases with proficiency in the language, highlighting the similarity between FL knowledge and other forms of human capital. Given this, in the rest of the paper we focus more deeply on the economic value of English competence. We do so also considering that English represents the most widely spoken FL in Turkey — as well as in other non-English speaking countries in Europe (see European Union 2006, 2012) — and is commonly used as the *lingua franca* for commerce and trade (see Ku & Zussmann 2010, Fidrmuc 2011). However, so far we considered returns to different levels of competences in English to be the same for all the Turkish male workers, although there are several reasons, including existing evidence, to consider the existence of heterogeneity in the return to English skills, which is the subject of the next section.

5.3 Heterogeneous Returns to English Skills

5.3.1 Returns to English Skills by Frequency of English Use at Work

Following the previous literature on the return to FL skills (Saiz and Zoido, 2005, Lang and Siniver, 2009, Casale and Posel, 2011 and Azam et al., 2013 among others), we consider the possibility of heterogeneous returns to English skills according to several available observed characteristics. First, as noticed by Grin et al. (2010), until now we implicitly consider that skills in English are remunerated because they are used in the labor market. If this is true, the return to English competences should increase — at least to a certain extent — with the degree to which English is used at work. However, it might also be the case that English proficiency constitutes a signal for other valuable skills from the employer's perspective. This means that being proficient in English would be remunerated even if not actually used at work. We use the information about frequency of English use at work to check for the potential heterogeneity of return to English depending on the frequency of its use in the workplace. Table 7 reports selected coefficients from different equations allowing the returns to English skills to be different according to the frequency of its use at work[23] (model 1), which are also estimated controlling for occupation fixed effects (model 2) and for parental education (model 3).

The results suggest a concave relationship between returns to English skills and the rate at which it is claimed to be used in the workplace. Actually having regular skills in English receives better remuneration if this language is used at least once per month, since the premium decreases in the case of more recurrent use of English at work. The evidence for advanced skills is similar, except that the premium decreases only in the case of daily use. Moreover, the shape of this concavity is somewhat more pronounced when estimated within the same occupation, implying that English competence serves as a signal for acceding to certain jobs. In fact, there is a positive remuneration for regular and advanced skills in English that are mostly unused in the workplace, but which are taken as signals of other cognitive and non-cognitive skills by the employer. On the other hand, the same skill

[23] The model is estimated including interactions between English skills and the frequency of English usage at work, plus all the controls included in previous specifications (complete results are available upon request).

level is less remunerated when English is commonly used at work, because in this case having advanced competences in English may only represent a prerequisite to enter the job. In any case, the relevance of English skills as human capital remains clear given the positive returns to English knowledge — regardless of the frequency of its use at work — and general increases with added proficiency. Additionally, taking into account the precision of the estimated returns by frequency of English use at work, we are unable to discriminate against constant returns for each skill level in English.

5.3.2 Returns to English Skills by Age-Cohorts

Secondly, Table 8 shows the results when the sample is split into two subsamples by age cohort. These cohorts are a younger (25-39) cohort and an older (40-65) cohort. Consistent with the results from India reported by Azam et al. (2013), the return to English skills in Turkey appears to be significantly higher for the older cohort of workers. This evidence indicates that while the demand for workers with English language competence increased, the supply must have also increased since otherwise returns would be higher for the young than their elders. Indeed, in India, the older cohort of workers endowed of advanced English competences obtain up to 70% higher earnings than their counterparts from the same age-cohort who do not know English at all. However, advanced English skills are less well remunerated in the labor market for the younger cohort of workers, although the estimated premium is still positive and significant. The return to regular English skills is also higher for the older cohort, but not statistically different from that of the younger cohort. Overall, the evidence obtained by splitting the sample by cohort highlights the scarcity of this alternative human capital asset (i.e. English language competences) among the older subsample of workers. Additionally, controlling for occupation fixed-effects generates a more sensible reduction of the return to advanced English skills among the younger cohort. This result suggests that the effect of English knowledge on the chances of attaining a better remunerated job is especially pronounced in the earlier phases of the labor market career. An alternative explanation[24] for this evidence is that FL competences are becoming more relevant for acceding certain types of jobs

[24] This ambivalent interpretation of the results by cohort concerning occupation derives from the impossibility of separating age from (pure) cohort effects in a cross-section of data.

which are better rewarded than in the past. Finally, while basic English skills are not rewarded among the younger cohorts, there is a modest return for basic competences for the older cohort, which appears to come mainly from the occupational channel (i.e. it loses significance once we control for occupation fixed effects).

5.3.3 Returns to English Skills by Education and Occupation

Third, we consider the existence of potential complementarities between English competences and other labor market skills. Following, among others, Lang and Siniver (2009), Casale and Posel (2011) and Azam et al. (2013), we estimate separate equations for workers with low, medium and high educational attainments. The main results are reported in Table 9. The evidence for Turkey appears — to some extent — at odds with what is generally reported for other countries. While other authors obtained significant complementarities between education and FL knowledge (i.e. the returns to FL knowledge are higher for the more educated), in our case there is instead some weak evidence of substitutability between English skills and formal education. More specifically, the return to advanced English skills is similarly higher for the medium-and-low-educated workers, and the return to regular English competences is higher for low-educated individuals than for their medium-and-high-educated counterparts — who get a similar return to this level of command of English. Additionally, only low-educated workers obtain a positive reward for basic English skills. However, due to loss of precision, especially among the low-educated, returns to English skills are not statistically different between the three educational groups. Controlling for occupation reduces a substantial amount of the return to advanced English skills among workers with secondary education, although it barely modifies the return to the same level of competences among the low-educated. Finally, the positive return to basic English skills among low-educated workers is clearly reduced once occupation is controlled for and it further loses statistical significance after the inclusion of parental education.

In order to have a deeper insight about the (in)existence of language- formal education complementarities, we compute the return to English skills according to birth-cohort and completed education (in a similar fashion as in Azam et al., 2013).[25] The results, reported in Table 10, indicate complementarity between English skills and formal education among the older cohort, since the return to advanced English skills appears to be higher for medium and high educated workers — with a higher coefficient for the former than for the latter. However, among younger workers there is substitutability between formal education and English proficiency, since the return to advanced English skills is higher for the low-educated workers―given the (marginally) significant negative interaction coefficients between English competences and education dummies. On the one hand, this picture is consistent with the idea that, among younger workers, English knowledge is more widespread and also more commonly demanded while hiring the highly educated and hence not reflected in higher earnings. Still, less educated young workers fluent in English enjoy a comparative advantage relative to their equally-less-educated counterparts who do not have any English competence. On the other hand, among the older workers, only those who attained a certain level of formal education are able to exploit all the labor market potential of English proficiency.

Additional evidence on the complementarities between FL knowledge and other labor market skills can be obtained by estimating the model for different types of occupations, as done by Saiz and Zoido (2005) for the USA, by Lang and Siniver (2009) for Israel, and by Willams (2011) for EU countries. We divided the sample according to the standard high/low skill—white/blue collar categorization based on the two-digit ISCO88 occupational classification. In this case we obtain a rather limited degree of heterogeneity in the estimated return to English skills, which appears to be very similar for the four occupational groups (see Table 11). The most noticeable exception is the high return to the English skills for the high-skilled blue-collar workers compared to other workers, especially for advanced competences, although the estimates are somewhat imprecise and not distinguishable in statistical terms. It seems worth noting that the premium for being proficient in English is also positive, albeit imprecisely estimated, for low-skilled blue-collar workers, consistent with evidence regarding heterogeneous returns by education.

[25] Specifically, with the aim of maintaining a sufficient number of observation in each model, we estimated the equation(s) separately for the younger (25-39) and the older (40-65) birth-cohorts and we interacted English skills dummies with two dummies for completed education that capture the differential returns to English skills for medium-and-high educated workers (relative to the base category of low-educated workers).

5.3.4 Returns English skills by Rural/Urban Areas

The final point consists in estimating the model separately for urban and rural areas, as was done by Azam et al. (2013). They found that, among Indian male workers, there is no difference in returns to English language based on either rural or urban residential location. Similarly, our results for Turkish men in Table 12 show that returns to regular English skills is virtually the same for urban and rural areas, albeit that the earnings premium to advanced English skills is slightly higher in urban areas. This evidence is probably due to that, while demand for English skills should be higher in urban areas, most of the economic activities in which English is relevant and remunerated as an asset also take place in urban areas as this is where multinational firms, government and information and communication technology (ICT) intensive firms mostly operate. The presence of more schools in big cities and the increasing migration of more skilled workers towards urban agglomerations means that the supply of workers with English skills would be higher in such locations. In any case, the coefficients for workers in rural areas are somewhat imprecisely estimated. This does not provide evidence against the null hypothesis of equal returns to English skills between urban and rural areas.

Overall, our heterogeneity exercise indicates some heterogeneity in the returns to English skills, which in some cases appear to be opposite of what was previously reported in the literature. However, most of the differences observed in the point estimates are not statistically significant, stressing the robustness of positive economic returns to English competences in the Turkish labor market.

5.4 An IV strategy for the return to English skills

The results reported in the previous sections show that, generally, FL knowledge is associated with higher labor market earnings. More specific results regarding the return to English skills are extremely robust, indicating that the conditional relationship between competences in English and earnings is positive and substantial, confirming the evidence obtained in other studies for both developed (Saiz and Zoido, 2005, Lang and Siniver, 2009, Ginsburg and Prieto-Ridríguez, 2011) and developing countries (Toomet 2011, Casale & Posel 2011, Azam et al. 2013). However, there might be some concern about the extent to which this conditional association is (not) close to the true causal parameters of interest. Previous evidence suggests that the return to FL knowledge appears to be barely — if at all — affected by endogeneity bias. In other words, the return to FL skills is still positive when estimated using either individual fixed-effects or instrumental variables methods. The stability of returns to English skills given the simultaneous inclusion of indicators for competences in other languages and also to several heterogeneity exercises make us feel comfortable that the extent of bias coming from unobserved characteristics should be rather limited. Even so, the presence of endogeneity bias might still present an issue meriting additional consideration. Moreover, our estimates might also be biased due to potential measurement/misclassification error in the self-reported measures of language skills, as there is a tendency to over-report[26]. Further, there may be reverse causality since individuals who earn more can afford higher expenses for learning FLs, for the purposes of either work or leisure activities.

On the basis of these concerns, we implement an Instrumental Variable (IV) method with the aim of obtaining consistent estimates of the economic value of English competences in the Turkish labor market. In order to identify the key parameters (i.e. the return to English skills), at least one valid exclusion restriction is needed. The challenge of finding a suitable exclusion restriction is often very hard in the absence of quasi-experimental data, especially because of the non-trivial condition of orthogonality between the instrument and earnings potential. In this application, we exploit information on the frequency of English use for leisure as the exclusion restriction. We assume that the increase in the frequency of language use for leisure purposes 1) increases the propensity of being more skilled in English and 2) is related to labor market earnings only through its direct effect on English competences (i.e. it is conditionally unrelated to the error term of the earnings equation). The validity of condition 1) can be directly inferred from the data.

[26] See Dustmann and van Soest (2001, 2002, 2004) and Dustmann and Fabbri (2003) for detailed discussion about measurement error issue in the context strictly related to the earnings return to host country's language proficiency among immigrants.

The second hypothesis cannot be directly tested. Moreover, it might be argued that using English more frequently in the daily life would facilitate the access to better social networks and increase the chances of obtaining a better-remunerated job in which English represents a valuable asset. In this case, the second assumption would not be valid. However, we consider that controlling for the frequency of English use at work in the earnings equation would break this potential link between our exclusion restriction and unobserved earnings potential[27]. Therefore, in what follows we present different specifications of our IV estimation that includes as additional control, the frequency of English usage at work. Moreover, we also provide the results from overidentification tests, which indicate whether the selected instrument can be reasonably excluded from the earnings equation(s).

Selected estimates from our IV strategy are reported in Table 13 (complete results are available upon request). Before discussing the results, it is worth remarking that our dependent variable (i.e. net monthly earnings) is only observed in intervals. Given that standard IV methods applied to the mid-point of earnings intervals might be seriously biased, we implement the "Instrumental Variable Interval Regression" (originally proposed by Bettin and Lucchetti, 2012), which can be estimated by Limited Information Maximum Likelihood (LIML). In order to simplify the model, we initially focus on an endogenous dummy of English proficiency, which takes the value of one for individuals who have advanced skills in English. The results are reported in the first four columns of Table 13.

In the bottom panel, we show the coefficients of the exclusion restrictions used in the first stage[28], whose estimates are in the expected direction. Moreover, the tests for

[27] Put in other words, if speaking English more frequently with friends, relatives and in the daily life in general provides access to jobs in which English is more important (and in principle used more often), this would be mostly picked up by the included dummies for the frequency of English use at work. Notice that just including dummies for the frequency of English usage at work in a standard earnings equation augmented by English skills produces a modest reduction in the estimated return to English knowledge, which is virtually the same as what we obtained controlling (only) for occupation fixed effects. Moreover, we applied our IV strategy also using as exclusion restriction the general frequency of FL use rather than English use, obtaining similar results (available upon request).

[28] The full results from the first stage regressions are not reported for space reasons, but are available upon request. The estimates indicate — in a robust way across different specifications — that having more schooling makes more likely achieving a higher level of competences in English. Experience affects negatively English skills, capturing the detrimental effect of age on the likelihood of mastering English. As expected, the increase of the frequency of English use at work and for leisure has a positive effect on English skills, with a more marked effect of the latter, while those who reside in urban

instrument validity suggest that the selected exclusion restrictions are strong predictors of language proficiency (i.e. they are jointly significant at any significance level). The overidentification test in the first column, in which we do not control for the frequency of English use at work, does not reject the null hypothesis of excludability only at a significance level of 10%. However, when the frequency of English use at work is additionally controlled for (second column), the frequency of English use for leisure appears to be conditionally independent from earnings and thusly can be correctly used as an exclusion restriction. Moreover, returns estimated using this IV strategy, and also controlling for English use at work, are again positive and statistically significant, ranging between 0.44 and 0.5. Indeed, these show little statistical difference from the estimate obtained without accounting for the endogeneity of English skills. Indeed, the exogeneity test indicates that the estimated returns to English skills obtained without controlling for potential endogeneity seem to be consistent, at least when the frequency of language use for leisure is included into the model with the linear first-stage.

In the subsequent step, we explicitly take into account the dichotomous nature of the endogenous variable (i.e. language proficiency). The LIML method proposed by Bettin and Lucchetti (2012) is in principle consistent also when the endogenous variable is neither a dummy, nor a continuous variable. However, we accommodate for a Probit specification for the first stage equation[29]. The results from this alternative specification are reported in columns 5-8 of Table 13, and appear to be very similar to those obtained using a linear probability model for the first step. The most noticeable differences are the modest increase in the estimates' precision achieved using the Probit model for the first stage (also estimated by LIML), and the more pronounced decrease in the return to English proficiency when controlling for occupation and for parental education. Finally, we also implement a more compelling endogenous specification for the return to English skills, considering four increasing levels of English skills — i.e. we specify an Ordered Probit for the first step. The coefficients estimated allowing for endogenous (categorical) skills in English (columns 9-

areas have higher propensity to be proficient in English. Parental education also exerts a positive effect on the likelihood of having higher English skills. Finally, there is no significant effect of labor market variables and occupation FE.

[29] The estimations have been carried out using the STATA routine "cmp" developed by Roodman (2011). For the IV estimation with a Linear Probability Model in the first stage we obtained the same results using "cmp" as with using the GRETL routine that has been kindly provided by Bettin and Lucchetti (2012) — which we also used for obtaining the overidentification tests.

12 of Table 14) are somewhat higher than those obtained without controlling for endogeneity (see column 1 of Table 6 for comparison), but confirm the existence of increasing returns to higher levels of competences in English. Also in this case, controlling for occupation and parental education reduce to a certain extent the point estimates, but does not undermine the significance and the general results obtained for regular and advanced English skills.

In general, our IV strategy confirms the reliability and the robustness of a positive and increasing economic value of English skills in the Turkish labor market. There is some modest sign of negative endogenous selection, given that the correlation between the error term of the earnings equation and error term of the first stage equation (i.e. the “rho” coefficient) is always negative and appears to be significant in non-linear first stage IV models. This means that, in principle, the return to English skills estimated neglecting endogeneity would be — at least to some extent — downward biased. However, the exogeneity test tends to lose statistical significance when controlling for occupation suggesting that, if any kind of endogenous selection into English skill levels exists, it would mainly operate through the occupational channel. Moreover, the “net” downward bias of the return to language skills has been previously attributed to the prevalence of the attenuation bias coming from measurement error in self-reported language proficiency over the unobserved ability bias (as suggested by Dustman and van Soest, 2001, 2002, and by Ginsburg and Prieto-Rodríguez, 2011 among others). Nevertheless, under non-classical errors-in-variables, which could be the case of our categorical language skills variable, the IV estimation should also provide upward biased coefficients, which represent upper bounds of the unbiased estimates (as shown by Kane et al., 1999 and Black et al., 2000). Apart from that, if our hypothesis about the exclusion restriction used in the IV estimation fails, the instrument (i.e. the frequency of English use for leisure) is correlated with the same unobservable elements affecting English competences and earnings potential and the return to English skills estimated with our IV models is likely to be biased towards the OLS (interval regression in our case) estimate. This would be especially likely in the case that unobserved heterogeneity mostly affects the propensity to know English and not too much the levels of proficiency, since the variation generated by the frequency of language use for leisure affect only individuals who actually know some English. However, although it might be argued that the returns to English skills reported in this study may not represent the true causal parameters of interest, they might be still upwardly biased—at least to some extent, we cannot discard the existence of a positive and substantial economic value of English knowledge. Whatever the case may be, the overall results from our analysis can be considered as sufficiently robust as to conclude that skills in FLs and especially in English are positively rewarded in the labor market in the case of the Turkish economy.

5.5 Summary of Empirical Results

The aim of this paper is to quantify the returns to competences in FLs in Turkey. We initially consider the economic value of different FLs among employed males aged 25 to 65. Our results highlight that, in general, the knowledge of FLs has a positive economic value in the Turkish labor market. These returns appear to be (only) in part related to the occupational channel (i.e. those who master FLs are likely to be attracted into better paid occupations[30]). The results are generally robust to the inclusion of controls for parental education, which proxy for both cognitive-and-non-cognitive skills and social networks. Among the more common languages in Turkey, English competences clearly represent a valuable asset, whose earnings return is robust across several specifications. The knowledge of Russian, especially advanced knowledge, is also highly rewarded in the labor market, as this language is relatively uncommon in Turkey. There is also some evidence of positive labor market rewards for mastering either French or German, although the economic value of these two languages seems mostly linked to occupation rather than productivity within occupations. On the contrary, knowing either Bulgarian or Arabic seems not to be rewarded in the labor market.

[30] Modeling the complex relationship between English knowledge, occupation and earnings represents an interesting extension of the current work, since the existing evidence concerning language proficiency among immigrants highlights that (immigrant) workers self-select into occupations according to their language skills, and this mediates a substantial part of the relationship between language and earnings (see Aldashev et al., 2009 and Chiswick and Miller, 2010). Moreover, the presence of salary premium for public sector workers according to their competences in English might introduce some positive language-related self-selection of more productive workers into the Turkish public sector, which can be treated in a similar fashion to Di Paolo (2012) for the case of Catalan knowledge and public/private sector selection.

In general, the earnings premiums for FL knowledge are comparable, but somewhat lower, than the returns to different levels of education in Turkey provided in Tansel (1994, 1996, 2010). Moreover, since English appears to be the most common FL spoken in Turkey, as well as in other non-English speaking countries, and has become the *lingua franca* for commerce and trade in the globalized world, we performed several additional estimations aimed at checking for heterogeneous returns to different levels of skills in this language. The earnings return to English skills obtained for Turkey is completely consistent with those for other developed and developing countries. In fact, the European evidence[31] obtained by Ginsburgh and Prieto-Rodríguez (2011) suggest that returns to English knowledge varies from 10% in Denmark, where English is widely spoken, to 49% in Spain, where speaking English as FL is significantly less common. Regarding developing countries, Toomet (2011) reports a return to English skills of about 45% in Estonia and 62% in Lavtia. The two existing studies for the case of South Africa indicate an earnings return to English proficiency that range between 18-25% (Levinshon, 2004) and 41-44% (Casale and Posel, 2011). Finally, the results reported by Azam et al. (2013) show a 35% premium for advanced English skills (in their most complete specification) for Indian males.

As expected, and in line with the literature, we find that the return to English proficiency is higher for the older cohort and in urban areas. However, our results regarding language-skills versus education complementarity are somewhat at odds with the evidence obtained from other countries. In fact, Lang and Siniver (2009) indicate that the return to English knowledge in Israel is about 16% for high educated workers and only 5% for the less-educated group. Similarly, the results obtained by Casale and Posel (2011) show that the premium to English proficiency in South Africa is substantially higher for tertiary educated workers than for less educated individuals. Finally, Azam et al. (2013) obtain certain evidence in favor of complementarity between English skills and formal schooling, which is mostly driven by the results for more educated young workers. On the contrary,

[31] Also Willams (2011) obtained significant and positive returns to the use of English at work in several European Countries. He also highlighted that the use of other languages — especially French and German — is relevant in some country, which can be considered in part consistent with our results regarding these two languages. However, we do not rely on the strict comparability between our results and those reported by Willams (2011), since he considered the return to language use at work instead of language competences.

our results suggest that the premium to advanced English skills is higher for medium-and-low educated workers, and returns to regular English skills are also higher for low educated workers, who also obtain a return to basic English competences. Moreover, on the one hand, we also find that the returns are higher at the low levels of education for the younger cohort of workers, suggesting some weak substitutability between formal education and English proficiency among young individuals. On the other hand, the return to advanced English skills increases with attained education for older workers, indicating complementarity between schooling and English among those individuals. In addition, we also explored the possibility of heterogeneous returns to English skills by occupational groups, although these results were less conclusive.

In any case, our heterogeneity analysis reveals that a positive economic value of English skills exists for several subgroups of workers, highlighting the overall significance of our results. With the aim of verifying that our estimates of the return to English skills are not just reflecting unobserved individual heterogeneity, we also implemented an IV strategy, based on information about the use of English skills for leisure and at work. The results obtained using different specifications — in which we account for the interval-coding of earnings and for the discrete/ordinal nature of English skills — are very similar to those obtained without considering the potential bias provoked by unobserved heterogeneity and/or misclassification errors in self-reported English competences. This confirms the existence of increasing economic returns to different levels of English skills, which appears to be robust to the estimation method. Although it might be argued that the estimated returns to English knowledge and competences, as well as to other FLs, reported in this study do not exactly represent the true causal parameters of interest, the whole evidence reported in this paper suggest that we cannot discard a positive and substantial reward of this alternative form of human capital in the Turkish labor market.

7. Conclusions and Policy implications

The knowledge of foreign languages represent a form of human capital. Drawing on data from the 2007 Adult Education Survey, this is the first study that estimates the earnings returns to FL skills in Turkey, a country recently characterized by rapid economic and social development. The ongoing changes in the Turkish economy have fostered the relevance of and demand for FL competences in the labor market. However, the endowment of FL skills among the Turkish labor force appears to be rather scarce. Overall, this situation points to the existence of substantial economic premiums to the command of FLs. Quantifying such returns represents the main purpose of this paper.

Examining the returns to FLs is important, since it will guide policy makers and individuals about how much to invest in fostering competences in FLs among current and future generations of workers. Overall, the results from our study suggest that acquiring competences in FLs represents a profitable investment in the Turkish labor market. The returns to this investment are clearly positive at the individual level. Indeed, becoming proficient in English, but also in Russian and, to a lesser extent French, and German, constitutes a significant potential for higher earnings and, more generally, for better labor market performance, as FL knowledge seems to increase the chances of obtaining a better and more remunerated job. Thus proficiency in FLs has important implications in terms of labor market outcomes, since it improves employability, occupational prospects and earnings potential. Moreover, it seems plausible that the economic value of FL knowledge would be positive not only at the individual level, but also at the societal level.

Several researchers commented on the low level of human capital of Turkish workers, especially those employed in the informal sector[32]. As the Turkish AES-2007 data highlights, almost 60-65% of the Turkish labor force has only 8 years of education at the

[32] The differential role of language skills in formal-and-informal sectors is an issue that should be examined in more detail, especially in the light of the relevance of informal employment in the Turkish labor market (as reported by Tansel and Kan, 2012). Unfortunately, the AES data do not provide suitable information for identifying informal workers (such as Social Security coverage), which prevented the in-deep analysis for formal and informal workers. However, we run separate language-augmented earnings regressions by type of employment (i.e. salaried workers, employees and self-employed workers) obtaining similar results for the return to English skills. This result can be taken as indirect evidence that being proficient in English should be rewarded in both the formal and informal sectors; in any case, a more detailed investigation of this issue should be done once more detailed data becomes available.

current compulsory, basic education level. The performance of the Turkish 15 year-olds in the PISA[33] test is rather poor. Indeed, in the 2009 PISA test Turkey ranks 32nd among the 34 countries ahead of only Chile and Mexico. The average 15-year-old student in Turkey is one full year behind the OEDC average (World Bank, 2013). Enhancing human capital, the endowment of education, and its equitable distribution among different socio-economic groups present current challenges for achieving and maintaining a sustainable path of growth and development in the mid- to long-term in Turkey. However, our results suggest that fostering FL skills should be taken as an additional challenge for Turkish policy makers. There are several reasons to consider that increasing competences in FLs among the Turkish population would further promote international trade, internationalization and openness in the Turkish economy, as well as R&D activities and innovation. In turn, this would generate greater potential for growth and socio-economic development of the nation, improving its position in the global knowledge economy.

Indeed, improving English skills among the population would be especially beneficial for a mid-sized developing country such as Turkey, since it may help reduce existing disparities in global competition between emerging economies for international trade and attracting new FDIs. This is extremely relevant in light of the significant scale and resource advantages of the two leading Asian emerging countries, India and China. In fact, in the former, English represents a former colonial language that is co-official and widely spoken among the population, especially among the highly educated, and the latter has the largest English-learner population in the world (Crystal, 2008, He and Li, 2009). Moreover, we believe that, relative to other mid-sized emerging economies, fostering competences in English, as well as in other relevant European languages, might be especially important in Turkey for two additional reasons. First, given the geographical location of the country, this could favor its historical role of "bridge" for commodities trading between Asia and Europe. Second, reducing language barriers would be especially relevant for further attenuating already reduced cultural barriers between Turkey and EU countries, which might represent an additional stimulus for commerce and trade.

[33] PISA stands for Programme for International Student Assessment. It is implemented each three years (from 2001) by OECD to test 15- year-olds skill and knowledge and competencies in the areas of reading, mathematics and science.

Several policy implications can be directly advocated in light of our results, which can be reasonably extrapolated to other developing countries as well as to developed countries with insufficient endowment of FL skills in their labor forces. First, policy makers should emphasize teaching of English at schools, in order to increase the English proficiency of future generations of workers. This would be especially important due to growing demand for FLs competences in the Turkish labor market in the near future, with the prospect of further economic growth and development and possible access to the EU. The 1997 Turkish Education System reform increased the amount of FL teaching during the schooling process. The radical changes of the subsequent 2012 reform also introduced a gradual increase in FL instruction. However, there is no evidence about the effectiveness of these reforms in improving the FL proficiency of students from different grades. Therefore, evaluating the effect of the 1997 reform on English proficiency represents an object of our future research[34]. Moreover, the government should also foster English teachers' training and professional requirements, since teachers play a fundamental role in guaranteeing the effectiveness of the above-mentioned educational reforms.

Second, for the current generation of workers, future public policies should be directed to encourage and subsidize their attendance at private FL centers. This is a sensible approach as our findings point out certain, albeit not high, substitutability between English skills and general schooling for the young. In fact, beyond earnings, FL skills may also enhance employability and labor market opportunities for low-educated young individuals who may possibly come from a disadvantaged socio-economic and family background. Moreover, as suggested by Rupérez-Micola et al. (2012), broadcasting films or programs in their original English with subtitles in national language, as done in several countries, especially in Northern Europe, might help increase English skills among the population.

Here we emphasize English as the FL to be taught, not only because of its international value and in light of its relevance compared to other languages that emerges from our results, but also because there currently is a substantial stock of English language teachers,

[34] Indeed, the future availability of the Turkish AES 2012 data will enable estimating the causal effect of the increase in teaching English at schools with the 1997 reform. In fact, the new data will contain information about individuals who are affected by the reform (i.e. the treatment group) and the others who are not exposed to the reform (i.e. the control group).

albeit still less than demand for them. Teaching Russian in schools would take time to accomplish, because of the need first to train teachers. The current demand for Russian speaking workers could be met by teaching Russian at special schools such as tourism schools or at FL centers. There may be also some space for policies aimed at improving competences in German and French. However, our less conclusive results regarding these two languages, and given the hegemony of English as the *lingua franca*, less priority should be given to investments in these languages.

In contrast, our findings suggest that there is no earnings premium to knowledge of Arabic and Bulgarian in the Turkish labor market. Given these results, from an economic perspective, the policy makers should discontinue investing scarce resources into teaching Arabic at the religious vocation schools[35]. These skills are not rewarded in the labor market and hence are non-productive. Also noteworthy is the absence of Chinese language instruction in Turkey, excepting a couple of university programs. Chinese language instruction could be important given recent increases in the volume of trade with China[36].

Further, since most productive potential of FL skills is expected to be allocated in the private sector, especially among firms exposed to English-intensive activities such as international trade, R&D, ICT and tourism, private businesses should contribute to financing FL training in their workforce and complement government's public investment. Finally, Turkey should be able to benefit more from language competences of citizens with immigrant backgrounds, such as the growing population of return-migrants from Germany attracted by the current economic development path of the country.

[35] A recent law passed at the parliament mandated that starting with the 2013-2014 academic year the "Ottoman language" will be a compulsory course at the social sciences high schools and an elective course in all other high schools (Sol Portal, April 6, 2013). A dead language like Ottoman language is expected to have no economic value in the labor market. It could be instructed to those specializing in the Ottoman history or Ottoman literature at the undergraduate or post-graduate programs of the universities rather than at the high schools.

[36] China was Turkey's 14th largest export partner in 2012 and 1st export destination among Asia-Pacific countries. Turkey's exports to China were 2.8 billion USD in 2012 and 2.5 billion USD in 2011. Regarding imports, China was Turkey's 3rd largest partner in 2012 and Turkey's imports from China realized as 21.3 billion USD in 2012, and 21.7 billion USD in 2011. Moreover, FDI stock of China in Turkey amounts to 26 million USD between 2002 and 2012 (TURKSTAT, 2013). Therefore, we expect a substantial and growing labor market value of Chinese language competences in Turkey. Unfortunately, we were unable to quantify the return to Chinese knowledge, since the number of Chinese speakers in our sample was too low in order to consider this language in the empirical analysis.

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TABLES

Table 1: foreign languages among Turkish employed males

	no Foreign Languages	one Foreign Language	two Foreign Languages	three or more FLs	TOTAL (%)
BIRTH COHORT					
cohort 25-39	64.59	31.11	3.70	0.61	100
cohort 40-65	73.62	22.63	3.45	0.29	100
COMPLETED EDUCATION					
low-education	92.93	6.18	0.73	0.16	100
medium-education	57.83	37.93	3.83	0.40	100
high-education	18.35	68.41	11.69	1.55	100
OCCUPATION					
high-skilled white collars	45.39	46.66	7.06	0.89	100
low-skilled white collars	62.34	32.91	4.00	0.75	100
high-skilled blue collars	86.02	12.63	1.22	0.14	100
low-skilled blue collars	80.08	17.04	1.73	0.14	100
URBAN/RURAL AREAS					
urban	64.49	31.11	3.88	0.52	100
rural	78.66	18.12	2.89	0.34	100
TOTAL (%)	68.60	27.34	3.59	0.47	100
NUMBER OF OBSERVATIONS	6307	2514	330	43	9194

Table 2: spoken foreign language (among foreign language speakers, N = 2877)

	English	French	German	Arabic	Bulgarian	Russian	Others
BIRTH COHORT							
cohort 25-39	85.4	4	10.5	7.8	0.1	3.1	1.4
cohort 40-65	70.1	13	14	12.2	0.9	1.8	1.4
COMPLETED EDUCATION							
low-education	45.9	4.1	18	30	2.5	4.7	7.5
medium-education	79.9	7.2	10.8	8	0.2	3	1.1
high-education	88.6	8.3	11.4	5.8	0	1.6	0.1
OCCUPATION							
high-skilled white collars	83.8	8	11.8	7.7	0.2	2.3	0.7
low-skilled white collars	85.2	5.6	11.2	7	0	3.2	0.8
high-skilled blue collars	68.4	7	12.2	14.4	1	2.5	3.2
low-skilled blue collars	68.5	7.1	12.2	14.5	1	3.3	3
URBAN/RURAL AREAS							
urban	82.4	7.5	11.4	7.0	0.3	2.8	0.9
rural	69.2	6.7	13.5	19.5	0.9	1.8	3.2
TOTAL (%)	79.8	7.3	11.8	9.5	0.4	2.6	1.4

Table 3: foreign language skills (among foreign language speakers, N = 2877)

	% over FL speakers	*basic skills*	*regular skills*	*advanced skills*
first FL = English	76.86	*55.02*	*31.82*	*13.16*
first FL = French	5.23	*73.51*	*16.56*	*9.93*
first FL = German	8.31	*49.17*	*32.08*	*18.75*
first FL = Arabic	6.89	*17.09*	*37.19*	*45.73*
first FL = Bulgarian	0.24	*28.57*	*28.57*	*28.57*
first FL = Russian	0.90	*11.54*	*69.23*	*19.23*
first FL = Other	1.56	*20.00*	*22.22*	*57.78*

Table 4: foreign languages and net monthly earnings (in Turkish liras)

	All the sample	at least one FL	English	French	German	Arabic	Bulgarian	Russian	Other FL
415 TL or less	19.0	7.3	5.6	5.6	7.3	19.8	27.3	2.7	27.5
416-529 TL	18.0	10.6	9.7	8.5	10.0	12.4	9.1	12.0	22.5
530-799 TL	22.0	17.9	17.9	11.3	19.6	15.7	36.4	13.3	25.0
800-1149 TL	21.1	27.5	27.6	28.3	25.2	34.1	9.1	33.3	7.5
more than 1150 TL	19.9	36.7	39.3	45.2	37.8	17.9	18.2	38.7	17.5
Total (%)	100	100	100	100	100	100	100	100	100
average monthly earnings	742.2	986	1018.7	1102.9	992.5	776.5	657.7	1030.2	615.4

Table 5: foreign language knowledge and earnings

	Number of foreign languages	English	French	German	Arabic	Bulgarian	Russian	all FLs	all FLs	all FLs
constant	5.275[a]	5.259[a]	5.265[a]	5.260[a]	5.255[a]	5.255[a]	5.255[a]	5.276[a]	5.256[a]	5.200[a]
	(0.039)	*(0.039)*	*(0.040)*	*(0.039)*	*(0.039)*	*(0.039)*	*(0.039)*	*(0.040)*	*(0.044)*	*(0.045)*
years of schooling	0.073[a]	0.074[a]	0.080[a]	0.080[a]	0.081[a]	0.081[a]	0.081[a]	0.073[a]	0.052[a]	0.049[a]
	(0.002)	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*
potential experience	0.033[a]	0.034[a]	0.032[a]	0.032[a]	0.032[a]	0.032[a]	0.032[a]	0.034[a]	0.031[a]	0.032[a]
	(0.002)	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*	*(0.002)*
(potential experience)^2	-0.001[a]	-0.001[a]	-0.000[a]	-0.000[a]	-0.000[a]	-0.000[a]	-0.000[a]	-0.001[a]	-0.000[a]	-0.000[a]
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*	*(0.000)*
employee - permanent contract					*reference category*					
employee - fixed term contract	-0.246[a]	-0.244[a]	-0.243[a]	-0.244[a]	-0.243[a]	-0.243[a]	-0.244[a]	-0.245[a]	-0.225[a]	-0.214[a]
	(0.024)	*(0.024)*	*(0.024)*	*(0.024)*	*(0.024)*	*(0.024)*	*(0.024)*	*(0.024)*	*(0.025)*	*(0.025)*
self employed	-0.063[a]	-0.064[a]	-0.066[a]	-0.066[a]	-0.066[a]	-0.066[a]	-0.067[a]	-0.064[a]	-0.022	-0.019
	(0.015)	*(0.015)*	*(0.015)*	*(0.015)*	*(0.015)*	*(0.015)*	*(0.015)*	*(0.015)*	*(0.018)*	*(0.018)*
employer	0.412[a]	0.413[a]	0.415[a]	0.414[a]	0.415[a]	0.415[a]	0.413[a]	0.411[a]	0.356[a]	0.350[a]
	(0.026)	*(0.026)*	*(0.026)*	*(0.026)*	*(0.026)*	*(0.026)*	*(0.026)*	*(0.026)*	*(0.028)*	*(0.028)*
urban area	0.253[a]	0.250[a]	0.252[a]	0.252[a]	0.252[a]	0.252[a]	0.251[a]	0.249[a]	0.154[a]	0.150[a]
	(0.013)	*(0.013)*	*(0.013)*	*(0.013)*	*(0.013)*	*(0.013)*	*(0.013)*	*(0.013)*	*(0.013)*	*(0.013)*
parental education = no education					*reference category*					
parental education = primary										0.084[a]
										(0.012)
parental education = secondary										0.122[a]
										(0.028)
parental education = tertiary										0.164[a]
										(0.033)
occupation fixed effects	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*yes*	*yes*
number of observations	9194	9194	9194	9194	9194	9194	9194	9194	9194	9194
log-likelihood	-12929	-12931	-12956	-12955	-12958	-12958	-12953	-12923	-12524	-12494
pseudo R^2	0.206	0.206	0.204	0.205	0.204	0.204	0.205	0.207	0.237	0.237

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01.

Table 5 (continued): foreign language knowledge and earnings

	Number of foreign languages	English	French	German	Arabic	Bulgarian	Russian	all FLs	all FLs	all FLs
no foreign languages					*reference category*					
one foreign language	0.091[a]									
	(0.015)									
two foreign languages	0.140[a]									
	(0.031)									
three or more foreign languages	0.317[a]									
	(0.076)									
knows English		0.112[a]						0.113[a]	0.090[a]	0.082[a]
		(0.015)						*(0.015)*	*(0.015)*	*(0.015)*
knows French			0.064					0.080[b]	0.066[c]	0.066[c]
			(0.039)					*(0.038)*	*(0.037)*	*(0.037)*
knows German				0.064[b]				0.065[b]	0.041	0.036
				(0.028)				*(0.028)*	*(0.027)*	*(0.027)*
knows Arabic					-0.019			-0.021	-0.057[c]	-0.044
					(0.033)			*(0.033)*	*(0.032)*	*(0.032)*
knows Bulgarian						-0.027		-0.035	-0.049	-0.056
						(0.168)		*(0.155)*	*(0.178)*	*(0.172)*
knows Russian							0.186[a]	0.142[b]	0.146[a]	0.135[b]
							(0.056)	*(0.056)*	*(0.053)*	*(0.054)*
occupation fixed effects	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*no*	*yes*	*yes*
number of observations	9194	9194	9194	9194	9194	9194	9194	9194	9194	9194
log-Likelihood	-12929	-12931	-12956	-12955	-12958	-12958	-12953	-12923	-12524	-12494
pseudo R^2	0.206	0.206	0.204	0.205	0.204	0.204	0.205	0.207	0.237	0.237

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01.

Table 6: return to foreign language skills

	English skills	French skills	German skills	Russian skills	all FLs skills	all FLs skills	all FLs skills
no foreign languages				*reference category*			
basic English skills	0.030[c]				0.041[b]	0.034[b]	0.030[c]
	(0.017)				*(0.017)*	*(0.016)*	*(0.016)*
regular English skills	0.198[a]				0.211[a]	0.173[a]	0.165[a]
	(0.024)				*(0.024)*	*(0.023)*	*(0.023)*
advanced English skills	0.454[a]				0.468[a]	0.390[a]	0.378[a]
	(0.038)				*(0.038)*	*(0.037)*	*(0.038)*
basic French skills		-0.030			0.039	0.034	0.036
		(0.051)			*(0.051)*	*(0.049)*	*(0.049)*
regular French skills		0.102			0.177[c]	0.119	0.130
		(0.101)			*(0.100)*	*(0.092)*	*(0.088)*
advanced French skills		-0.024			0.055	-0.066	-0.092
		(0.151)			*(0.150)*	*(0.135)*	*(0.137)*
basic German skills			0.058		0.115[b]	0.102[b]	0.099[b]
			(0.047)		*(0.047)*	*(0.045)*	*(0.045)*
regular German skills			-0.071		-0.015	-0.070	-0.073
			(0.055)		*(0.054)*	*(0.053)*	*(0.053)*
advanced German skills			0.105		0.157[c]	0.143[c]	0.135[c]
			(0.082)		*(0.080)*	*(0.077)*	*(0.077)*
basic Russian skills				0.242	0.267	0.223	0.203
				(0.377)	*(0.366)*	*(0.354)*	*(0.352)*
regular Russian skills				0.172	0.216[c]	0.238[b]	0.227[b]
				(0.115)	*(0.113)*	*(0.110)*	*(0.110)*
advanced Russian skills				0.366[a]	0.412[a]	0.345[b]	0.356[b]
				(0.138)	*(0.145)*	*(0.139)*	*(0.141)*
parental education	*no*	*no*	*no*	*no*	*no*	*no*	*yes*
occupation fixed effects	*no*	*no*	*no*	*no*	*no*	*yes*	*yes*
number of observations	9194	9194	9194	9194	9194	9194	9194
log-Likelihood	-12863	-12957	-12955	-12955	-12854	-12471	-12444
pseudo R^2	0.204	0.204	0.204	0.204	0.206	0.236	0.238

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01. All the models include controls for years of schooling, potential experience (quadratic), labor market status and a dummy for urban area.

Table 7: heterogeneous returns to foreign language skills — frequency of language use at work

	model 1	model 2	model 3
no English skills	*reference category*		
basic English skills - not used at work	0.007	0.010	0.008
	(0.018)	*(0.017)*	*(0.017)*
basic English skills - used less than once per month	0.104[c]	0.087	0.080
	(0.057)	*(0.054)*	*(0.053)*
basic English skills - used at least once per month	0.272[a]	0.228[a]	0.219[a]
	(0.058)	*(0.059)*	*(0.059)*
basic English skills - used at least once per week	0.090	0.016	0.006
	(0.062)	*(0.061)*	*(0.061)*
basic English skills - daily used	0.115	0.116	0.104
	(0.097)	*(0.093)*	*(0.093)*
regular English skills - not used at work	0.154[a]	0.134[a]	0.126[a]
	(0.029)	*(0.028)*	*(0.028)*
regular English skills - used less than once per month	0.206[b]	0.164[b]	0.157[b]
	(0.082)	*(0.071)*	*(0.071)*
regular English skills - used at least once per month	0.376[a]	0.344[a]	0.330[a]
	(0.063)	*(0.061)*	*(0.061)*
regular English skills - used at least once per week	0.228[a]	0.167[a]	0.165[a]
	(0.063)	*(0.060)*	*(0.060)*
regular English skills - daily used	0.223[a]	0.172[a]	0.165[a]
	(0.057)	*(0.053)*	*(0.052)*
advanced English skills - not used at work	0.368[a]	0.335[a]	0.335[a]
	(0.075)	*(0.075)*	*(0.074)*
advanced English skills - used less than once per month	0.382[a]	0.312[b]	0.301[b]
	(0.120)	*(0.124)*	*(0.125)*
advanced English skills - used at least once per month	0.423[a]	0.314[a]	0.301[b]
	(0.134)	*(0.121)*	*(0.122)*
advanced English skills - used at least once per week	0.520[a]	0.453[a]	0.441[a]
	(0.095)	*(0.093)*	*(0.093)*
advanced English skills - daily used	0.502[a]	0.412[a]	0.399[a]
	(0.050)	*(0.050)*	*(0.050)*
parental education	*no*	*no*	*yes*
occupation fixed effects	*no*	*yes*	*yes*
number of observations	9194	9194	9194
log-Likelihood	-12773	-12398	-12397
pseudo R^2	0.206	0.236	0.236

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01. All the models include controls for years of schooling, potential experience (quadratic), labor market status and a dummy for urban area.

Table 8: heterogeneous returns to foreign language skills — birth-cohort

	cohort 25-39			cohort 40-65		
no English skills	*reference category*			*reference category*		
basic English skills	0.011	0.013	0.009	0.068[b]	0.048	0.044
	(0.019)	*(0.018)*	*(0.018)*	*(0.032)*	*(0.031)*	*(0.031)*
regular English skills	0.154[a]	0.125[a]	0.117[a]	0.289[a]	0.241[a]	0.228[a]
	(0.027)	*(0.026)*	*(0.026)*	*(0.048)*	*(0.046)*	*(0.046)*
advanced English skills	0.373[a]	0.299[a]	0.287[a]	0.705[a]	0.642[a]	0.625[a]
	(0.043)	*(0.042)*	*(0.043)*	*(0.087)*	*(0.086)*	*(0.086)*
parental education	*no*	*no*	*yes*	*no*	*no*	*yes*
occupation fixed effects	*no*	*yes*	*yes*	*no*	*yes*	*yes*
number of observations	5011	5011	5011	4083	4083	4083
log-likelihood	-7299	-7046	-7028	-5500	-5346	-5335
pseudo R^2	0.187	0.230	0.234	0.217	0.243	0.246

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01. All the models include controls for years of schooling, potential experience (quadratic), labor market status and a dummy for urban area.
Cohort 25-39 = individuals aged between 25 and 39.
Cohort 40-65 = individuals aged between 40 and 65.

Table 9: heterogeneous returns to foreign language skills — education

	high education			medium education			low education		
no English skills	*reference category*			*reference category*			*reference category*		
basic English skills	0.023	0.036	0.035	0.026	0.022	0.017	0.121[b]	0.083[c]	0.074
	(0.033)	*(0.032)*	*(0.032)*	*(0.021)*	*(0.020)*	*(0.020)*	*(0.050)*	*(0.045)*	*(0.045)*
regular English skills	0.110[a]	0.099[a]	0.098[a]	0.180[a]	0.142[a]	0.127[a]	0.337[a]	0.264[a]	0.239[a]
	(0.036)	*(0.036)*	*(0.036)*	*(0.033)*	*(0.031)*	*(0.031)*	*(0.093)*	*(0.091)*	*(0.091)*
advanced English skills	0.321[a]	0.288[a]	0.292[a]	0.439[a]	0.339[a]	0.317[a]	0.467[b]	0.468[a]	0.447[a]
	(0.047)	*(0.047)*	*(0.048)*	*(0.075)*	*(0.079)*	*(0.081)*	*(0.189)*	*(0.163)*	*(0.173)*
parental education	*no*	*no*	*yes*	*no*	*no*	*yes*	*no*	*no*	*yes*
occupation fixed effects	*no*	*yes*	*yes*	*no*	*yes*	*yes*	*no*	*yes*	*yes*
number of observations	1488	1488	1488	3211	3211	3211	4495	4495	4495
log-likelihood	-1494	-1432	-1429	-4775	-4623	-4615	-6493	-6286	-6266
pseudo R^2	0.084	0.286	0.286	0.113	0.163	0.165	0.113	0.159	0.166

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01. All the models include controls for years of schooling, potential experience (quadratic), labor market status and a dummy for urban area.
High education = college education or more.
Medium education = upper-and-lower secondary education.
Low education = primary education or less.

Table 10: heterogeneous returns to foreign language skills — birth-cohort & education

	cohort 25-39			cohort 40-65		
no English skills	*reference category*			*reference category*		
basic English skills	0.117[b]	0.065	0.048	0.205[b]	0.161[b]	0.146[c]
	(0.055)	*(0.051)*	*(0.051)*	*(0.084)*	*(0.076)*	*(0.076)*
regular English skills	0.238[b]	0.204[b]	0.171[c]	0.482[a]	0.343[b]	0.316[b]
	(0.118)	*(0.101)*	*(0.098)*	*(0.142)*	*(0.146)*	*(0.146)*
advanced English skills	0.712[a]	0.588[a]	0.580[a]	0.232	0.245	0.193
	(0.210)	*(0.168)*	*(0.192)*	*(0.149)*	*(0.211)*	*(0.203)*
medium education * basic English skills	-0.056	-0.017	-0.005	-0.157[c]	-0.138	-0.130
	(0.059)	*(0.056)*	*(0.056)*	*(0.094)*	*(0.086)*	*(0.086)*
Medium education * regular English skills	-0.034	-0.049	-0.027	-0.167	-0.088	-0.085
	(0.124)	*(0.107)*	*(0.104)*	*(0.158)*	*(0.159)*	*(0.159)*
Medium education * advanced English skills	-0.388[c]	-0.371[c]	-0.384[c]	0.672[a]	0.599[b]	0.620[b]
	(0.225)	*(0.190)*	*(0.211)*	*(0.219)*	*(0.266)*	*(0.263)*
high education * basic English skills	-0.155[b]	-0.067	-0.054	-0.108	-0.080	-0.069
	(0.070)	*(0.066)*	*(0.067)*	*(0.105)*	*(0.097)*	*(0.097)*
High education * regular English skills	-0.173	-0.126	-0.099	-0.231	-0.120	-0.106
	(0.127)	*(0.110)*	*(0.108)*	*(0.160)*	*(0.163)*	*(0.163)*
High education * advanced English skills	-0.438[b]	-0.337[c]	-0.341[c]	0.442[b]	0.362	0.397[c]
	(0.217)	*(0.177)*	*(0.199)*	*(0.191)*	*(0.239)*	*(0.231)*
parental education	*no*	*no*	*yes*	*no*	*no*	*yes*
occupation fixed effects	*no*	*yes*	*yes*	*no*	*yes*	*yes*
number of observations	5011	5011	5011	4083	4083	4083
log-likelihood	-7301	-7048	-7023	-5510	-5350	-5335
pseudo R^2	0.187	0.230	0.234	0.237	0.243	0.246

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01. All the models include controls schooling dummies (high and medium education, low education as reference category), potential experience (quadratic), labor market status and a dummy for urban area. The base-level coefficients for English skills represent the earning return to English skills for low-educated workers (reference category).

Table 12: heterogeneous returns to foreign language skills — urban/rural areas

	urban area			rural area		
no English skills	*reference category*			*reference category*		
basic English skills	0.015	0.015	0.014	0.092[b]	0.077[b]	0.065[c]
	(0.018)	*(0.017)*	*(0.017)*	*(0.041)*	*(0.039)*	*(0.039)*
regular English skills	0.198[a]	0.165[a]	0.159[a]	0.188[a]	0.138[b]	0.127[b]
	(0.025)	*(0.024)*	*(0.024)*	*(0.059)*	*(0.058)*	*(0.059)*
advanced English skills	0.470[a]	0.392[a]	0.384[a]	0.365[a]	0.294[b]	0.284[b]
	(0.040)	*(0.039)*	*(0.039)*	*(0.117)*	*(0.117)*	*(0.120)*
parental education	*no*	*no*	*yes*	*no*	*no*	*yes*
occupation fixed effects	*no*	*yes*	*yes*	*no*	*yes*	*yes*
number of observations	6528	6528	6528	2666	2666	2666
log-likelihood	-9089	-8829	-8828	-3630	-3530	-3530
pseudo R^2	0.182	0.220	0.222	0.160	0.192	0.193

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01. All the models include controls for years of schooling, potential experience (quadratic) and labor market status.
Urban area = individuals residing in urban areas.
Rural area = individuals residing in rural areas.

Table 13: heterogeneous returns to foreign language skills — occupation

	high-skilled white-collars			high-skilled blue-collars			low-skilled white-collars			low-skilled blue-collars		
no English skills	*reference category*			*reference category*			*reference category*			*reference category*		
basic English skills	-0.003	-0.008	-0.011	0.063	0.066[c]	0.058	0.058	0.056	0.056	0.023	0.025	0.023
	(0.027)	*(0.027)*	*(0.027)*	*(0.039)*	*(0.038)*	*(0.038)*	*(0.036)*	*(0.035)*	*(0.036)*	*(0.033)*	*(0.032)*	*(0.032)*
regular English skills	0.175[a]	0.166[a]	0.155[a]	0.150[b]	0.168[b]	0.145[b]	0.118[b]	0.117[b]	0.123[b]	0.145[b]	0.145[b]	0.153[b]
	(0.032)	*(0.032)*	*(0.032)*	*(0.068)*	*(0.068)*	*(0.067)*	*(0.048)*	*(0.048)*	*(0.048)*	*(0.070)*	*(0.068)*	*(0.068)*
advanced English skills	0.380[a]	0.353[a]	0.333[a]	0.635[a]	0.616[a]	0.602[a]	0.333[a]	0.336[a]	0.352[a]	0.409[b]	0.356[c]	0.388[b]
	(0.048)	*(0.048)*	*(0.049)*	*(0.159)*	*(0.149)*	*(0.153)*	*(0.075)*	*(0.078)*	*(0.079)*	*(0.163)*	*(0.183)*	*(0.171)*
parental education	*no*	*no*	*yes*	*no*	*no*	*yes*	*no*	*no*	*yes*	*no*	*no*	*yes*
occupation fixed effects	*no*	*yes*	*yes*	*no*	*yes*	*yes*	*no*	*yes*	*yes*	*yes*	*yes*	*yes*
number of observations	2917	2917	2917	2875	2875	2875	1325	1325	1325	2077	2077	2077
log-likelihood	-3606	-3562	-3558	-4062	-4014	-3997	-1922	-1916	-1911	-3002	-2899	-2888
pseudo R^2	0.152	0.157	0.157	0.133	0.146	0.151	0.189	0.195	0.197	0.111	0.161	0.166

Note: robust standard errors within parenthesis in italic. [c] Significant at p<0.1, [b] significant at p<0.05, [a] significant at p<0.01.
All the models include controls for years of schooling, potential experience (quadratic), labor market status and a dummy for urban area.
High-skilled White collar = individuals with 2-digits ISCO88 comprised between 11 and 34.
Low-skilled White collar = individuals with 2-digits ISCO88 comprised between 41 and 52.
High-skilled Blue collar = individuals with 2-digits ISCO88 comprised between 61 and 74.
Low-skilled Blue collar = individuals with 2-digits ISCO88 comprised between 81 and 93.

Table 14: endogenous foreign language skills and earnings

EARNINGS EQUATION	**LINEAR (LPM) FIRST STAGE**				**PROBIT FIRST STAGE**				**ORPOBIT FIRST STAGE**			
proficient in English	0.698	0.501	0.467	0.444	0.711	0.527	0.450	0.416				
	(0.089)^{a}	*(0.124)*^{a}	*(0.121)*^{a}	*(0.126)*^{a}	*(0.062)*^{a}	*(0.082)*^{a}	*(0.086)*^{a}	*(0.093)*^{a}				
no English skills									*reference category*			
basic English skills									0.117	0.106	0.091	0.091
									(0.031)^{a}	*(0.041)*^{b}	*(0.041)*^{b}	*(0.042)*^{b}
regular English skills									0.312	0.276	0.238	0.236
									(0.043)^{a}	*(0.059)*^{a}	*(0.059)*^{a}	*(0.061)*^{a}
advanced English skills									0.610	0.556	0.482	0.481
									(0.062)^{a}	*(0.087)*^{a}	*(0.087)*^{a}	*(0.090)*^{a}
FIRST STAGE												
frequency of English use for leisure (exclusion restrictions)												
no English or not used	*reference category*				*reference category*				*reference category*			
less than once per month	0.157	0.114	0.108	0.101	0.877	0.581	0.568	0.547	1.330	1.024	1.034	1.015
	(0.027)^{a}	*(0.026)*^{a}	*(0.026)*^{a}	*(0.026)*^{a}	*(0.106)*^{a}	*(0.119)*^{a}	*(0.121)*^{a}	*(0.122)*^{a}	*(0.065)*^{a}	*(0.071)*^{a}	*(0.071)*^{a}	*(0.072)*^{a}
at least once per month	0.248	0.189	0.183	0.173	1.168	0.810	0.819	0.802	1.610	1.218	1.238	1.209
	(0.040)^{a}	*(0.040)*^{a}	*(0.040)*^{a}	*(0.040)*^{a}	*(0.137)*^{a}	*(0.157)*^{a}	*(0.158)*^{a}	*(0.163)*^{a}	*(0.098)*^{a}	*(0.111)*^{a}	*(0.110)*^{a}	*(0.112)*^{a}
at least once per week	0.408	0.326	0.326	0.313	1.558	1.121	1.177	1.145	1.899	1.481	1.509	1.471
	(0.041)^{a}	*(0.040)*^{a}	*(0.040)*^{a}	*(0.040)*^{a}	*(0.114)*^{a}	*(0.132)*^{a}	*(0.131)*^{a}	*(0.132)*^{a}	*(0.092)*^{a}	*(0.103)*^{a}	*(0.100)*^{a}	*(0.101)*^{a}
daily used	0.394	0.274	0.268	0.259	1.495	0.829	0.873	0.869	1.771	1.207	1.249	1.233
	(0.050)^{a}	*(0.050)*^{a}	*(0.049)*^{a}	*(0.049)*^{a}	*(0.161)*^{a}	*(0.167)*^{a}	*(0.162)*^{a}	*(0.163)*^{a}	*(0.132)*^{a}	*(0.140)*^{a}	*(0.140)*^{a}	*(0.142)*^{a}
parental education	*no*	*no*	*no*	*yes*	*no*	*no*	*no*	*yes*	*no*	*no*	*no*	*yes*
occupation fixed effects	*no*	*no*	*yes*	*yes*	*no*	*no*	*yes*	*yes*	*no*	*no*	*yes*	*yes*
frequency of English use at work	*no*	*yes*	*yes*	*yes*	*no*	*yes*	*yes*	*yes*	*no*	*yes*	*yes*	*yes*
rho	-0.117	-0.066	-0.069	-0.063	-0.442	-0.296	-0.254	-0.217	-0.139	-0.137	-0.116	-0.121
	(0.031)^{a}	*(0.040)*	*(0.041)*^{c}	*(0.043)*	*(0.067)*^{a}	*(0.098)*^{a}	*(0.108)*^{b}	*(0.119)*^{c}	*(0.043)*^{a}	*(0.057)*^{b}	*(0.060)*^{b}	*(0.061)*^{b}
overidentification test (p-value)	*0.061*	*0.379*	*0.365*	*0.409*	--	--	--	--	--	--	--	--
significance of excl. restr. (p-value)	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
exogeneity test (p-value)	*0.000*	*0.107*	*0.093*	*0.140*	*0.000*	*0.005*	*0.025*	*0.078*	*0.001*	*0.017*	*0.056*	*0.051*

Note: robust standard errors within parenthesis in italic. ^{c} Significant at $p<0.1$, ^{b} significant at $p<0.05$, ^{a} significant at $p<0.01$.
All the models include controls for years of schooling, potential experience (quadratic), labor market status and a dummy for urban area.
Rho represents the estimated correlation coefficient between the earnings equation's residual and the first stage's residual.
The exogeneity test consists in a χ^2 test for the null hypothesis that the estimated rho coefficient is equal to zero.

Table 1A: descriptive statistics

	ALL THE SAMPLE		NO FL		AT LEAST ONE FL		BEST FL = ENGLISH	
	mean	*s.d*	mean	*s.d*	mean	*s.d*	mean	*s.d*
CONTROL VARIABLES								
years of schooling	8.26	*3.82*	6.70	*3.00*	11.65	*3.15*	12.16	*2.76*
age	38.99	*9.36*	39.73	*9.44*	37.37	*8.95*	36.22	*8.60*
potential experience (= years of schooling – age – 6)	24.67	*10.77*	26.95	*10.49*	19.75	*9.68*	18.05	*8.93*
urban area	0.710	*0.45*	0.668	*0.47*	0.803	*0.40*	0.832	*0.37*
employee/permanent contract	0.595	*0.49*	0.541	*0.50*	0.714	*0.45*	0.745	*0.44*
employee/fixed-term contract	0.059	*0.24*	0.070	*0.26*	0.035	*0.18*	0.029	*0.17*
self-employed	0.285	*0.45*	0.336	*0.47*	0.175	*0.38*	0.151	*0.36*
employer	0.060	*0.24*	0.053	*0.22*	0.076	*0.26*	0.075	*0.26*
PARENTAL EDUCATION								
parental education = no education	0.332	*0.47*	0.403	*0.49*	0.176	*0.38*	0.133	*0.34*
parental education = primary or less	0.588	*0.49*	0.568	*0.50*	0.631	*0.48*	0.639	*0.48*
parental education = secondary	0.046	*0.21*	0.020	*0.14*	0.103	*0.30*	0.121	*0.33*
parental education = tertiary	0.034	*0.18*	0.008	*0.09*	0.090	*0.29*	0.107	*0.31*
OCCUPATION								
high-skilled white collars	0.317	*0.47*	0.210	*0.41*	0.552	*0.50*	0.576	*0.49*
low-skilled white collars	0.144	*0.35*	0.131	*0.34*	0.173	*0.38*	0.187	*0.39*
high-skilled blue collars	0.313	*0.46*	0.392	*0.49*	0.139	*0.35*	0.119	*0.32*
low-skilled blue collars	0.226	*0.42*	0.267	*0.44*	0.136	*0.34*	0.118	*0.32*
FREQUENCY OF ENGLISH USE AT WORK AND FOR LEISURE								
no English skills	0.759	*0.43*	--	--	0.231	*0.42*	--	--
English not used at work	0.178	*0.38*	--	--	0.568	*0.50*	0.739	*0.44*
English used less than once per month at work	0.024	*0.15*	--	--	0.076	*0.27*	0.099	*0.30*
English used at least once per month at work	0.013	*0.11*	--	--	0.042	*0.20*	0.055	*0.23*
English used at least once per week at work	0.015	*0.12*	--	--	0.048	*0.21*	0.063	*0.24*
English daily used at work	0.011	*0.10*			0.034	*0.18*	0.044	*0.21*
English not used for leisure	0.759	*0.43*	--	--	0.231	*0.42*	--	--
English used less than once per month for leisure	0.158	*0.36*	--	--	0.503	*0.50*	0.655	*0.48*
English used at least once per month for leisure	0.017	*0.13*	--	--	0.054	*0.23*	0.070	*0.25*
English used at least once per week	0.018	*0.13*	--	--	0.057	*0.23*	0.075	*0.26*
English used at least once per week for leisure	0.020	*0.14*	--	--	0.063	*0.24*	0.082	*0.28*
English daily used for leisure	0.028	*0.17*	--	--	0.091	*0.29*	0.118	*0.32*

***Definition of years of schooling**: illiterate = 0 years; literate with no formal education = 2; uncompleted primary education = 3.5; completed primary school = 5; uncompleted middle school = 6.5; completed middle school = 8; uncompleted high school = 9.5; completed high school = 11; uncompleted short college degree = 12; completed short college degree = 13; uncompleted college degree = 14; completed college degree = 15; uncompleted PhD = 17; completed PhD = 19.*

Table 2A: foreign language knowledge and earnings among the subsample of English speakers

	French	German	Arabic	Russian	all FLs	all FLs	all FLs
knows French	0.204[b]				0.180[b]	0.166[b]	0.161[c]
	(0.087)				*(0.086)*	*(0.084)*	*(0.083)*
knows German		0.100[c]			0.070	0.054	0.049
		(0.053)			*(0.054)*	*(0.048)*	*(0.048)*
knows Arabic			-0.107[c]		-0.100[c]	-0.099[c]	-0.089
			(0.057)		*(0.057)*	*(0.059)*	*(0.060)*
knows Russian				0.164[b]	0.120[c]	0.120[c]	0.112[c]
				(0.068)	*(0.070)*	*(0.064)*	*(0.064)*
occupation fixed effects	*no*	*no*	*no*	*no*	*no*	*yes*	*yes*
number of observations	2219	2219	2219	2219	2219	2219	2219
log-Likelihood	-2774	-2775	-2776	-2775	-2660	-2657	-2774
pseudo R^2	0.173	0.173	0.173	0.173	0.174	0.221	0.221

Note: robust standard errors within parenthesis in italic. [c] Significant at $p<0.1$, [b] significant at $p<0.05$, [a] significant at $p<0.01$. All the models include controls for years of schooling, potential experience (quadratic), labor market status and a dummy for urban area. Estimations based on the subsample of individuals who declare English to be the best FL they know. Knowledge of Bulgarian is not considered in this analysis because of the reduced number of observations in this subsample.